Office - Supreme Court, U.S.
FILED
JUL 25 1983
ALEXANDER L. STEVAS
CLERK

83-132

No. _____

IN THE

Supreme Court of the United States

OCTOBER TERM, 1983

STRUTHERS PATENT CORPORATION,
STRUTHERS WELLS CORPORATION and
STRUTHERS SCIENTIFIC & INTERNATIONAL CORPORATION,

Petitioners,

–against–

THE NESTLE COMPANY, INC.,

Respondent.

APPENDIX TO PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

Appendix Pages A-509 – A-683

SIDNEY R. BRESNICK
Counsel of Record for Petitioners
330 Madison Avenue
New York, New York 10017
(212) 986-8686

Of Counsel:
PHILIP T. SHANNON
TERESE R. COHEN
Pennie & Edmonds
New York, New York

TABLE OF CONTENTS

	PAGE
Judgment Order of James Hunter, III, Circuit Judge, dated March 28, 1983	A-1
Sur Petition for Rehearing, dated April 25, 1983	A-3
Final Order of Judge Debevoise, dated May 6, 1982, United States District Judge	A-5
Opinion of Judge Debevoise, United States District Judge	A-31
Appellants' Petition for Rehearing In Banc	A-509
Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group I)	A-535
Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group III)	A-578
Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group III)	A-605
Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group IV)	A-635
Supplemental Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group I)	A-661

TABLE OF CONTENTS (Cont'd)

	PAGE
Supplemental Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group II)	A-665
Supplemental Affidavit in Opposition to Nestle's Motion for Partial Summary Judgment (Group IV)	A-671
Struthers Scientific and International Corporation Memorandum Subject: Maxwell House FreCon Unit	A-675
Patent Appendix (Bound in Separate Volume)	A-684

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

STRUTHERS PATENT CORPORATION,	:	
Appellant,	:	
v.	:	
THE NESTLE COMPANY, INC.,	:	
Appellee,	:	Appeal No. 82-5355
v.	:	
STRUTHERS WELLS CORPORATION AND STRUTHERS SCIENTIFIC & INTERNATIONAL CORPORATION,	:	
Appellants	:	

APPELLANTS' PETITION
FOR REHEARING IN BANC

Appellants, Struthers Patent Corporation, Struthers Wells Corporation and Struthers Scientific & International Corporation (collectively "Struthers"), respectfully request an *in banc* rehearing of this appeal pursuant to Rule 40,

F.R.A.P. The rehearing is requested in view of a Judgment Order entered by the Court on March 28, 1983 affirming without comment a summary judgment of invalidity of ten United States patents owned by Struthers.*

Rehearing in banc is requested because the basis on which summary judgment was granted by the district court is wholly inconsistent with and contrary to the procedures for summary judgment established by this Court in Tomalewski v. State Farm Life Insurance Co., 494 F.2d 882 (1974) and Federal Laboratories, Inc. v. Barringer Research Limited, 696 F.2d 271 (3rd Cir. 1982)

---

* Judgment was entered by the district court for the District of New Jersey on May 6, 1982. The opinion below has been reported at 211 U.S.P.Q. 1023 and appears in the Joint Appendix (JA) at JA 41.

among others. The district court decision, affirmed herein, renders meaningless the "slightest doubt" test espoused for this Circuit in Tomalewski and virtually ignores the Court's instructions in Federal Laboratories that on summary judgment courts are not permitted to disbelieve the good faith statements of experts made in affidavits.

It is safe to say that the decision below is both unprecedented in its scope and startling in that nothing in the case law of the Third or any other Circuit would lead one to expect that summary judgment could properly be granted given the facts in the present case. In Federal Laboratories, supra (page 274), this Court warned that ". . . summary judgment is 'not ordinarily appropriate for the disposition of a patent case,' and should therefore be employed with

great caution."* The safeguards which this Court has provided in Federal Laboratories and numerous other cases to prevent the substitution of summary judgment for a trial on the merits have not been observed herein with the resultant loss to Struthers of a substantial property right in ten patents without benefit of trial by jury as requested. The result reached below and affirmed herein calls for further consideration by the Court if it is to secure and maintain the uniformity of its decisions. Third Circuit Internal Operating Procedures, Ch. VIII B (1980).

We respectfully request the Court to consider the following aspects of this case when considering the petition:

---

* Emphasis is supplied herein unless otherwise noted.

1. In the Federal Laboratories case, supra (page 274), this Court held that a court "is [not] . . . at liberty to disbelieve the good faith statements of experts contained in depositions and affidavits and presented by the non-moving party.". Yet the district court below chose to disregard or disbelieve the uncontradicted sworn statements of Struthers' expert, Ganiaris, made in five affidavits submitted in opposition to the motions for summary judgment. Ganiaris, a professional chemical engineer who was in charge of Struthers' projects for the construction of freeze concentration plants for the General Foods Corporation, discussed the differences between the inventions disclosed and claimed in the patents in suit and the prior art cited by The Nestle Company and gave the reasons why these inventions would not be

obvious to one of ordinary skill in the art.

2. The district court below held that it was able to read and understand the subject matter of the patents in suit without the aid of expert testimony. But District Judge Latchum earlier held in Struthers Scientific & Int. Corp. v. General Foods Corp., 314 F.Supp. 313, 315 (D. Del. 1970), on a motion for summary judgment involving three of the same patents here in suit (patents Nos. 3,381,302; 3,404,007; and 3,449,129):

> "Were this Court skilled in the art it might be a simple matter to answer the questions required by the John Deere case, but this Court frankly admits that it lacks that special knowledge which would permit it to read the patents in suit so understandably, in terms of obviousness to a man of ordinary skill in the art, on the basis of the present record."

Since the only expert testimony before the court in addition to that before Judge Latchum was that of Ganiaris, the

clear implication of this is that the court made itself its own expert in the field and, on that basis, resolved the factual inquiries mandated by the Supreme Court in determining questions of obviousness under 35 U.S.C. § 103 in Graham v. John Deere & Co., 383 U.S. 1 (1966). This Court has cautioned that in summary judgment cases "...the court must be certain that it does not need any expert testimony or other extrinsic evidence to explain or evaluate . . . " the patents and prior art. Borden Co. v. Clearfield Cheese Co., 369 F.2d 96, 101 (3rd Cir. 1966).

3. The district court, based on its own interpretation of unexplained documents from the Struthers-General Foods lawsuit, held that Ganiaris had sworn falsely in his affidavits in connection with matters relating to alleged prior sales (35 U.S.C. § 102(b))

of the patented processes. But this Court held in Ness v. Marshall, 660 F.2d 517, 519 (3rd Cir. 1981), that "courts should not draw factual inferences in favor of the moving party and should not resolve any genuine issues of credibility." The Court's instruction in Ness v. Marshall is particularly pertinent here where Nestle submitted no affidavits or other sworn testimony to controvert Ganiaris. Thus, Ganiaris' credibility was judged, unfairly, without the benefit of further explanation or discussion by the witness such as would occur at trial.

4. In Tomalewski, supra (page 884), this Court held that summary judgment was a "drastic remedy" which "may not be granted where there is the slightest doubt as to the facts." If the slightest doubt test had been applied in the case at bar then summary judgment should have

been denied on the basis of the following material facts of record:

a. Struthers has shown that the "dewaxing" problem addressed by its patents persisted despite continued efforts to effect a solution for at least nine months after the time that the district court below held that it was so "easily" solved and sold to General Foods in May 1964 (Struthers Br. 16-27).* An inference favorable to Struthers may be drawn from this fact, as the mandate of this Court instructs on summary judgment, that the invention was not completed and, therefore, not sold

---

* Reference is to Brief For Appellants (Struthers).

under 35 U.S.C. § 102(b) at the time the district court held.

b. An inference favorable to Struthers may be drawn from the fact that General Foods filed a patent application on dewaxing in June 1966 (JA 2317), long after the time the district court found it had been sold to General Foods (Struthers Br. 26-27). General Foods acknowledged in a letter from its Executive Vice President to Struthers' Chairman that the wax removal process was regarded by General Foods as "essential to successful operation of your [Struthers' FreCon] system" (JA 1039);

c. The record evidence supported Ganiaris' sworn statement that prior to January 1965, General Foods did not "appreciate" that a dewaxing operation was necesary, a

statement which the district court below held to be "patently false" (JA 236). The facts, however, conclusively demonstrate that Struthers' mobile FreCon plant had no dewaxing facilities (JA 1954); dewaxing equipment was not included in the initial contract with General Foods of August 12, 1964 (JA 1361), nor was it included in the freeze concentration plant which Struthers designed and built for General Foods in December 1964 (JA 1391-97); the problem with wax continued at General Foods at least until February 1965 when Ganiaris noted that "This problem did not receive the proper attention from either organization, MH [Maxwell House] or SSI" (JA 1393-96). Can it be said that these facts do not meet the "slightest doubt" test as

expressed in Tomalewski, particularly where the reputation of the expert, Ganiaris, is involved? The reasonable inferences to be drawn from these facts were not viewed by the district court in the light most favorable to Struthers, the party in opposition to the motion, as this Court has instructed. Goodman v. Mead Johnson & Co., 534 F.2d 566, 573 (3rd Cir. 1976);

d. Is there not the slightest doubt with respect to the facts which showed that Struthers' contract of August 1964 with General Foods was for the sale of freeze concentration equipment only and that no freeze drying equipment was sold at that time (Struthers Br. 28-29, 41-44)? The district court's assumption, on the basis of a hearsay statement by an unknown General Foods engineer,

that General Foods intended to use the Struthers freeze concentration equipment in conjunction with freeze drying, constituted the drawing of an inference against Struthers in a situation where intent was a substantive element of the "on sale" defense. This has been held by this Court to be impermissible on summary judgment. Ness v. Marshall, supra (page 519). Moreover, in the earlier lawsuit between Struthers and General Foods, counsel for General Foods denied that it used the same temperature range for freeze drying which is stated in the claims of the Muller patents (Struthers Br. 32). This Court has also held that there must be substantial identity between that which was sold and the claims of the patent for there to have been a prior sale under 35 U.S.C. § 102(b).

DeLong v. Raymond International, Inc., 622 F.2d 1135, 1141 (3rd Cir. 1980).

5. In Federal Laboratories, supra, this Court held that a court is not permitted to disbelieve the good faith statements of experts made in affidavits on a motion for summary judgment. We therefore ask: Why did this Court insist in that case that Dr. Barringer's sworn statement, in which he stated that the prior art cited by Federal was not analogous to that disclosed in the patent in suit, be believed, and similar treatment not be accorded Struthers' expert, Ganiaris?

Ganiaris made the same types of analyses in his affidavits as those made by Dr. Barringer in the Federal Laboratories case. For example, Ganiaris analyzed the differences between freeze concentration processes used in

concentrating orange juice and that of coffee (the subject of the patents) and stated that they were not analogous. This was important when considering obviousness over prior art relating to processes for orange juice. Ganiaris said in his affidavits:

> "21. The problems faced by the coffee industry are substantially different from other producers of concentrated beverage products. In the orange juice industry, for example, orange juice is concentrated in order to simplify and decrease the cost of shipping orange juice product, a result accomplished by freeze concentration covered by several patents which have been cited in this case. Fresh orange juice, however, has approximately 8 to 12 percent dissolved materials, and this will not vary as with coffee extract. The feed of freshly-squeezed orange juice into a freeze concentration system, therefore, is always within this narrow range of solids.
>
> "22. Furthermore, the viscosity of freshly- squeezed orange juice solution is considerably lower than that of coffee extract as normally contained in commercial coffee extraction processes. It is well known that the formation and growth of crystals and subsequent separation

of the crystals from concentrated liquor are affected by the viscosity of the liquor. The habit (shape), size, size-distribution and rate of growth of the crystals depends upon the viscosity of the solution. In general, for high viscosities, crystals are small and separation is extremely difficult.

"23. In addition, the chemical composition of the dissolved matter in orange juice is entirely different from that of coffee. It is well known that even minute chemical differences can have a profound effect on the habit of the crystals during crystalization. Thus, the data for the formation of ice crystals in an orange juice solution cannot be extrapolated to encompass coffee extract. The chemicals in one case may be occluded in the crystal lattice so that no washing can remove such impurities or the chemicals may inhibit the growth of the ice crystals in one direction (flat-plates, middles, etc.) and thus separation becomes uneconomical.

"24. In short, it is readily apparent that orange juice concentration disclosures are not relevant prior art with respect to coffee. The choice of operating conditions for freeze concentrating coffee extract cannot be based upon experience with orange juice. Clearly, one with ordinary skill in the art of concentration of orange juice cannot (by performing experiments on orange juice) derive the optimum conditions for producing

discrete ice crystals and thereafter separating them from coffee extract efficiently in a manner which will result in commercial soluble coffee product." (JA 4230-31)

Ganiaris also discussed the differences between the prior art cited by Nestle, without benefit of expert commentary, and the patents in suit. He said:

"The '007 Patent is Different From Sperti 2,558,337 ('337) (Answering Nestle Br., p. 60)

"28. The '007 patent claims an invention which is quite different from that of Sperti '337. Sperti relates to concentration of orange juice only, and not to coffee product. As shown above, there is no way to extrapolate results from orange juice to coffee and experimentation with orange juice would have no value in providing an accurate prediction as to the results in a process for manufacturing coffee according to the '007 patent.

"The '007 Patent is Different from Clinton Ser. No. 830,195 ('195) (Answering Nestle Br., pp. 39-41, 69)

"29. The '195 Clinton application is quite different from that of the Muller '007 patent. First, the Clinton application does not specify the 1-5 percent moisture

content of the final coffee product, the importance of which is explained above. Second, the separation of the ice crystals from the coffee extract in Clinton is broadly defined, whereas the '007 patent is limited specifically to centrifugation, a technique which contributed to Muller's unique results." (JA 4233-34)

* * *

"The Flosdorf 2,471,677 ('677) Patent is Not the Same as Muller '007 (Answering Nestle Br., p. 81)

"32. The Flosdorf '677 patent discloses a freeze concentration process for orange juice. For the reasons stated above, patents concerning processes for manufacture of orange juice are of no value in determining what will happen with coffee due to the vast differences of these products. Furthermore, the Muller '007 patent refers to freeze concentration of coffee extract from 10 to 30 percent solids up to 30 to 50 percent solids by forming discrete ice crystals, separating them from coffee extract by centrifugation and washing the crystals with fresh water. On the basis of the above differences between orange juice and coffee extract, the Flosdorf '677 patent is not prior coffee art." (JA 4235)

* * *

"Bassett 529,202 ('202) is Not Prior Art as to Muller '007 (Answering Nestle Br., p. 16)

"43. The Bassett '202 patent refers to dilute solutions which could be less than 10% coffee solids. Nowhere does Bassett disclose any concentrations of 10-30% coffee solids. The coffee infusion as prepared by Bassett is similar to coffee made in a household percolator and such coffee solutions normally have less than 5% coffee solids. (JA 4239)

* * *

"Ganiaris '295 Is Not Invalid Over the Prior Art (Answering Nestle Br., pp. 39, et seq.)

"7. Sivetz (Nestle Tab R) does not show steps (a), (b) and (c) of claims 1 and 3 of the '295 patent. He simply mentioned the operations involved without showing the interelationship required for the process to function. For example, on page 15 of the Sivetz reference, he shows a phase diagram which clearly indicates that the ice-phase has large quantities of occluded coffee solids. If this phase diagram were correct, centrifuging and washing would not purify the ice beyond the limits set by the equilibrium lines. Struthers' research has proven that pure discrete ice crystals can be grown in coffee solutions without any occlusion. There is no prior art (patents, publications or anything

else) which shows what Struthers discovered and disclosed in patents ith respect to this phenomenon." (JA 4273-74)

* * *

"10. The Reimus inventions offered solutions to these problems. First, Reimus recognized differences between the 'waxy' materials that were removed at high temperatures (over 100 degress F.) and the precipitate that was formed at low temperatures (80 degrees to 32 degrees F.). Reimus found that

"a. The low temperature precipitate was a mixture of 'waxy' materials (with no effect on taste) and coffee components which were needed for making a good quality (flavor and aroma) product; and

"b. The ratio of the 'waxy' materials to the 'desirable' coffee components in the precipitate depended on the cooling technique of the extract.

"11. After having recognized these differences, Reimus offered specific solutions as seen in his patents. The Reimus inventions have been used in industrial applications for manufacturing millions of pounds of coffee. Furthermore, his inventions were not obvious, even to people closely involved with the freeze concentration and freeze drying technology related to coffee at the time the inventions were made. Reimus' discovery that the

precipitate was a mixture of 'waxy' materials and 'desirable' coffee solids and his method of wax removal were true contributions to the art." (JA 4288)

* * *

"The Reimus Patents Are Valid Over Prior Art

"27. Zorn 1,507,410 (cited by Nestle Br., pp. 8-12, 773-4) discloses a process for eliminating the undesirable elements which, upon standing, cause the chemical or other changes which break down the flavor of coffee concentrate. Reimus '302, on the other hand, discloses a process for eliminating the 'waxy' materials to avoid the plugging of the centrifuge and preventing the removal of 'desirable' coffee components.

"28. The key question is whether the 'undesirable' elements of Zorn are the same as those of Reimus. Obviously, neither patent discloses the composition of these materials, because it is impossible to do so when dealing with a natural product reduced to extract by various techniques. However, from the specification of these patents, it is clear Reimus refers to an extract which has been produced by an entirely different processing technique from the infusion of Zorn. The Reimus extract has been produced at high temperatures (250 degree F. to 350 degree F.) and chemical reactions have caused the generation

of polymeric substances which Reimus defines as tars or 'waxy' materials. Reimus' concentrations of 10-40% dissolved coffee solids clearly indicate production of extract by hydrolysis (chemical reaction) which takes place only at high temperatures.

"29. By contrast, Zorn's extract is an infusion produced with water which is hot but below the boiling point of water. It is known that at such a temperature hydrolysis can not proceed and, thus, the tars and 'waxy' materials can not be produced.

"30. The Zorn 'undesirables' are therefore entirely different from the Reimus 'waxy' type materials. The processes can not be compared because the materials to be eliminated and the reasons for removing them are entirely different. Indeed, Zorn discloses a process which, if applied to the coffee extract of Reimus, will cause precipitation and removal of most of the desirable coffee solids.

"31. Zorn 1,636,890 patent (cited at Nestle Br., p. 28) discloses a process for eliminating the 'undesirable' elements from fruit juices. This process is completely foreign to the coffee extract treated by the Reimus patent for reasons stated in my Group I affidavit (Para. 21-24).

* * *

> "34. Frederickson 2,410,157 (cited at Nestle Br., p. 9) discloses a process for removing deleterious waxes but he shows no high temperature extract. Reimus '302 describes a process for removing the high temperature 'waxy' type materials and preventing the removal of desirable coffee solids that affect flavor. In addition, Frederickson '157 does not disclose the concentrations of the extract or that he proceeds to dehydrate or freeze concentate the extract." (JA 4294-96)

All of the sworn statements made by Struthers' expert, Ganiaris, were uncontroverted and unopposed except for attorney argument which clearly is not evidentiary in nature. Such statements, if made in good faith, must be believed. Federal Laboratories v. Barringer Research Ltd., supra. Where there is the "slightest doubt" as to material facts, summary judgment must be denied. Tomalewski v. State Farm Life Insurance Co., supra. These rules were not followed by the district court in granting summary judgment herein nor was

the court's decision consistent with those prior binding decisions of the Third Circuit.

The principle stated by the Supreme Court in Poller v. Columbia Broadcasting System, Inc., 368 U.S. 464, 473 (1962), is most apposite here: ". . . It is only when the witnesses are present and subject to cross-examination that their credibility and the weight to be given their testimony can be appraised. Trial by affidavit is no substitute for trial by jury which so long has been the hallmark of 'even handed justice'".

For the reasons given above, Appellants respectfully request that this

Court grant its petition for a rehearing *in banc*.

Respectfully submitted,

SIDNEY R. BRESNICK
PHILIP T. SHANNON
TERESE R. COHEN
PENNIE & EDMONDS
330 Madison Avenue
New York, New York 10017
Attorneys for Appellants

Of Counsel:

WALDRON KRAEMER
KASEN & KRAEMER
A Professional Corporation
1180 Raymond Boulevard
Newark, New Jersey 07102

STATEMENT OF COUNSEL

I express a belief, based on a reasoned and studied professional judgment, that the panel decision is contrary to decisions of the United States Court of Appeals for the Third Circuit or the Supreme Court of the United States, and that consideration by the full court is necessary to secure and maintain uniformity of decisions in this Court, to-wit, the panel's decision is contrary to the decisions of this Court set forth in Federal Laboratories, Inc. v. Barringer Research Limited, 696 F.2d 271 (1982) and Tomalewski v. State Farm Life Insurance Co., 494 F.2d 882 (1974).

For The Petitioners

Sidney R. Bresnick

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION,	
Plaintiff,	Civil Action No. 663-72.
v.	AFFIDAVIT IN OPPOSITION TO NESTLE'S MOTION FOR PARTIAL SUMMARY JUDGMENT (GROUP I)
THE NESTLE COMPANY, INC.,	
Defendant,	
v.	(EXHIBITS NOT INCLUDED)
STRUTHERS WELLS CORPORATION, and STRUTHERS SCIENTIFIC AND INTERNATIONAL COPORATION,	
Additional Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. I joined Struthers Scientific & International Corporation ("Struthers Scientific" individually; collectively with Struthers Patent Corporation and Struthers Wells Corporation referred to as "Struthers") in 1962 and have been employed by it to date in various positions relating to research and development in the field of crystallizers and ice crystallization, primarily in connection with the manufacture of soluble coffee products. I make this affidavit in opposition to Nestle's motion for partial summary judgment of invalidity and/or unenforceability of Muller patents 3,404,007 (the '007 patent) and 3,495,522 (the '522 patent), also known as Nestle's Group I motion.

2. I hold a B.S. in Chemical Engineering granted by Purdue University in 1957 and an M.S. in Chemical Engineering granted by New York

University in 1960. In addition, I did graduate work toward a Doctorate in Chemical Engineering at New York University from 1960 to 1964.

3. I was employed by New York University as a research assistant from 1961 to 1962 and as a teaching assistant from 1957 to 1960 in Chemical Engineering.

4. I was employed by E.I. du Pont de Nemours and Co. as a research engineer from 1960 to 1961.

5. I was responsible for the design and installation of a plant sold to General Foods Corporation ("General Foods") by Struthers in 1964 and I provided technical assistance in the sale of this system.

6. I am registered as a Patent Agent to practice before the United States Patent and Trademark Office ("Patent Office"), having passed the examination given by the Patent Office after meeting

the qualifications to take such examination.

Background

7. Struthers Wells Corporation ("Struthers Wells") was formed in 1928 to take over the assets and business of three companies which had been in existence since 1851, 1860 and 1896, respectively. Presently, the business of Struthers Wells consists principally of the manufacture of process equipment for the chemical petroleum and electrical utilities industries.

8. In 1942, Struthers Wells acquired the exclusive rights for the United States and Canada with respect to the patents, know-how and experience that were originated by a Norwegian company, A/S Krystal, relating to the crystallization of chemical solutions for the purpose of separating specific

components. Thereafter, Struthers Wells developed improved crystallization equipment employed throughout the processing, refining and chemical industries for the crystallization of a great number of inorganic and organic chemicals, ranging from high tonnage heavy chemicals such as ammonium sulfate, ammonium phosphate, potassium chloride and sodium chloride to specialty items such as silver nitrate and fumaric acid. In 1958, development work began to apply the laws and principles practiced in the controlled crystallization process to the broad field of ice crystallization.

9. In 1961, Struthers Scientific was formed to take over certain assets and business from the parent company, Struthers Wells. The entire business and technology relating to crystallization process and equipment was acquired by Struthers Scientific from Struthers Wells.

10. Struthers Scientific continued the development work on crystallization and became one of the leading manufacturers of crystallizers in the world. The company's crystallizers are found in most major chemical and petrochemical complexes on the globe, including the Soviet Union and Eastern European countries.

11. With respect to ice crystallization, in 1962 Struthers Scientific initiated pilot plant studies for food product and beverage applications. Several products such as orange juice, vinegar, apple juice, tea and coffee extract were investigated. By 1963, Struthers Scientific had developed a system ("FreCon") which appeared to have the potential for commercialization.

12. In 1964, a sales contract with General Foods was signed for the first semicommercial freeze concentration plant

for manufacture of coffee extract. In 1965, the company sold another plant to General Foods, and later sold two plants to Deutsche Entrakt Kaffee, Gmbh in Germany and one plant to Cocam in Brazil. At present, I do not know whether these plants still freeze concentrate coffee extract.

13. Annexed hereto as Exhibit A is Struthers Scientific annual report for 1980 and accompanying letter to Shareholders they clearly indicate that crystallizers continue to be a major business for Struthers Scientific (see letter to Shareholders). Annexed as Exhibit B is the enclosed bulletin on KRYSTAL crystallizers which sets forth a long list of companies using this piece of equipment.

Introduction to Soluble Coffee Production

14. Soluble coffee products, also known as "instant coffee", have been sold commercially for many decades. The object of instant coffee is to reduce the time and other requirements for brewing a beverage type coffee from roasted and ground coffee beans. All producers of instant coffee strive to provide a soluble coffee product which, when dissolved in water, will resemble as much as possible the taste and aroma of freshly brewed coffee products. Obviously, there is also the economic consideration of producing such coffee at the lowest possible price.

15. Soluble coffee products have been produced in the past by many different methods. The method used can and usually does materially alter the taste and physical properties of the final soluble coffee product. For

example, a comparison of spray dried "Nescafe" with freeze dried "Tasters Choice", two soluble coffee products of The Nestle Company, Inc. which both result from methods of removal of soluble materials from ground roasted coffee beans, reveals differences in physical properties and the taste. These differences are in the physical properties as well as the chemical composition and are not easily definable.

16. After blending of coffee beans and roasting the blend, substantially all methods of producing soluble coffee products start with the extraction of soluble materials from roasted ground coffee by forcing hot (250° to 350°F) water or steam through the coffee grounds in an extractor and collecting the hot water with coffee solids dissolved therein. This is referred to as coffee extract or liquor. Commercial coffee

extract usually contains from 10% to about 30% of soluble coffee solids. As the percentage of coffee solids in the extract increases, the viscosity of the extract increases to a point where, in commercial extraction, the extract can have the viscosity of molasses or the like. By contrast, normal home brewed coffee is far less viscous, containing only about 3 to 5 percent coffee solids.

17. There are on the order of 300 different chemical compounds contained in commercial coffee extract, Such compounds vary from one blend to another depending upon the coffee beans used. Some of these compounds can react with each other, and can volatilize because they have a boiling point lower than that of water or can precipitate due to chemical reaction. Such reactions are dependent upon time and temperature, as well as upon the concentration of the extract.

18. After extraction, the coffee liquor is treated by one of many known processes to provide the final dry soluble coffee product. These processes include (i) direct spray drying of the extract, (ii) freeze concentration of the extract to provide a concentrated liquid coffee product as an end element, (iii) freeze drying of the extract, (iv) freeze concentration followed by freeze drying of the extract, and (v) drum drying. As stated above, the product resulting from each of these processes differs in physical properties and taste from process to process. In addition, the physical properties and the taste of the final product differ depending upon the beans, the concentrations at various steps of the process, temperatures, holding times and other factors.

19. Prior to Struthers' inventions, persons involved with manufacture of

soluble coffee products were of the opinion that pure ice crystals could not be formed when coffee extract was cooled to the point where the solvent (water) froze, because (they believed) either a non-crystalline ice would form or, if crystals did in fact form, the coffee solids would be occluded therein and therefore not susceptible to removal from the crystals by washing, centrifugation or the like.

20. The industry also faced critical problems with freeze-drying. For example, a certain amount of moisture must be retained in the final product, but there must not be too much moisture therein. When the amount of moisture in the final coffee product exceeds about 5 percent, the shelf-life of the product decreases rapidly. On the other hand, in order to remove enough moisture so the moisture content is less than 1 percent,

the freeze-drying process must be carried on for such a long period of time that the quality of the soluble coffee product deteriorates. Therefore, the moisture range of about 1 to 5 percent for freeze drying is both economically and qualitatively critical to obtain a commercial soluble coffee product which closely resembles the freshly brewed variety. Over-drying removes volatile flavor, whereas under-drying spoils shelf life and caking may also result.

21. The problems faced by the coffee industry are substantially different from other producers of concentrated beverage products. In the orange juice industry, for example, orange juice is concentrated in order to simplify and decrease the cost of shipping orange juice product, a result accomplished by freeze concentration covered by several patents which have been cited in this case.

Fresh orange juice, however, has approximately 8 to 12 percent dissolved materials, and this will not vary as with coffee extract. The feed of freshly squeezed orange juice into a freeze concentration system, therefore, is always within this narrow range of solids.

22. Furthermore, the viscosity of freshly squeezed orange juice solution is considerably lower than that of coffee extract as normally contained in commercial coffee extraction processes. It is well known that the formation and growth of crystals and subsequent separation of the crystals from concentrated liquor are affected by the viscosity of the liquor. The habit (shape), size, size-distribution and rate of growth of the crystals depends upon the viscosity of the solution. In general for high viscosities, crystals

are small and separation is extremely difficult.

23. In addition, the chemical composition of the dissolved matter in orange juice is entirely different from that of coffee. It is well known that even minute chemical differences can have a profound effect on the habit of the crystals during crystalization. Thus, the data for the formation of ice crystals in an orange juice solution cannot be extrapolated to encompass coffee extract. The chemicals in one case may be occluded in the crystal lattice so that no washing can remove such impurities or the chemicals may inhibit the growth of the ice crystals in one direction (flat-plates, middles, etc.) and thus separation becomes uneconomical.

24. In short, it is readily apparent that orange juice concentration

disclosures are not relevant prior art with respect to coffee. The choice of operating conditions for freeze concentrating coffee extract cannot be based upon experience with orange juice. Clearly, one with ordinary skill in the art of concentration of orange juice cannot (by performing experiments on orange juice) derive the optimum conditions for producing discrete ice crystals and thereafter separating them from coffee extract efficiently in a manner which will result in commercial soluble coffee product.

With the above in mind, I turn to the issues of the subject litigation.

Different Inventions are Claimed in Muller 3,404,007 ('007), Muller II and Muller 3,495,522 ('522) (Answering Nestle Group I Mem. [hereinafter "Nestle Br."], pp. 80-83)

25. The Muller '007, Muller II and '522 claims are for different inventions

because the '007 and Muller II claims are for a process and the '522 claims are for a mechanical apparatus. Many processes other than those claimed in '007 and Muller II can be performed in the apparatus claimed in '522. For example, the '522 apparatus can be used with very dilute coffee extract (less than 10 percent coffee solids), whereas the '007 process and claim 11 of Muller II specify a feed extract of 10 percent to 30 percent coffee solids. Also, the '522 apparatus can be used to dry the final product to more than 5 percent or less than 1 percent moisture or use a temperature range of -45°C. to +50°C. for freeze drying the extract, whereas the '007 and Muller II, claim 11 processes are limited to 1 to 5 percent moisture and a temperature range of -45°C. to zero degrees C. For at least these reasons

the '007 patent and Muller II are not directed to the same invention as '522.

The Muller II Application (Serial No. 738,776) is Different from the '007 Patent (Answering Nestle Br., pp. 55-60)

26. The Muller II application is directed to a different invention from the '007 patent because the Muller II application is limited to freezing the concentrated extract from zero degrees to -45°C., whereas the '007 patent calls for freeze drying at a temperature between zero degrees C. and -45°C. In addition, the Muller II application recovers solids from washings by dehydration. The '007 patent teaches the recycling of the washings to the feed extract prior to freeze concentration. The recycling of the washings shows that the quantity of wash water to be used is limited. (Otherwise the purpose of concentration would be defeated.) By contrast, under

Muller II, large quantities of wash water can be used.

27. The '007 patent also teaches the recycling of the washings to the extraction step. Since extraction requires very hot water, the washings must be heated to a very high temperature and consequently the coffee solids in the washings should be of very low concentration, because otherwise the continuous recycling of coffee solids and repeated heating to high temperature (212 degrees F. and above) would adversely affect the quality of the coffee product. As explained above, such continual heating of the extract would cause chemical reactions to take place which change the physical properties of the final coffee product and cause a deterioration of its taste. The Muller II application does not claim recycling to the extraction step.

The '007 Patent is Different from Sperti 2,588,337 ('337) (Answering Nestle Br., p. 60)

28. The '007 patent claims an invention which is quite different from that of Sperti '337. Sperti relates to concentration of orange juice only, and not to coffee product. As shown above, there is no way to extrapolate results from orange juice to coffee and experimentation with orange juice would have no value in providing an accurate prediction as to the results in a process for manufacturing coffee according to the '007 patent.

The '007 Patent is Different from Clinton Ser. No. 830,195 ('195) (Answering Nestle Br., pp. 39-41, 69)

29. The '195 Clinton application is quite different from that of the Muller '007 patent. First, the Clinton application does not specify the 1-5 percent moisture content of the final

coffee product, the importance of which is explained above. Second, the separation of the ice crystals from the coffee extract in Clinton is broadly defined, whereas the '007 patent is limited specifically to centrifugation, a technique which contributed to Muller's unique results.

30. Third, the temperature range for freeze drying of Clinton is not specified. As noted above, temperature is a very important feature in coffee processing and significantly affects the physical properties of the final product as well as the ultimate flavor thereof. Clinton discloses that the concentrated coffee extract is frozen below the eutectic point and that the coffee product temperature should be below 120 degrees F. Clinton does not indicate what the precise eutectic temperature is for any one coffee product. (This is

probably not known since coffee is a natural product, having about 300 different chemical compounds which vary with the coffee beans used.) Even if the eutectic point for a particular coffee product were known, it would not be a well-defined temperature-concentration point because it would only be applicable in very rare circumstances. In addition, Clinton merely provides for freezing the extract below the eutectic point, which means to any temperature all the way down to absolute zero. Therefore, there is no freezing temperature range which corresponds specifically to the range of zero degrees C. to -45°C taught by the Muller '007, As stated above, the range is important, and if this range were to be carried below -45°C., freeze drying costs mount rapidly.

31. Fourth, Clinton also teaches freeze drying under a vacuum of less than

500 microns. This means that the condenser (condensing the water) could theoretically be at a temperature as low as absolute zero. Clinton again does not define the very necessary range claimed by Muller '007.

The Flosdorf 2,471,677 ('677) Patent is Not the Same as Muller '007 (Answering Nestle Br., p. 8)

32. The Flosdorf '677 patent discloses a freeze concentration process for orange juice. For the reasons stated above, patents concerning processes for manufacture of orange juice are of no value in determining what will happen with coffee due to the vast differences of these products. Furthermore, the Muller '007 patent refers to freeze concentration of coffee extract from 10 to 30 percent solids up to 30 to 50 percent solids by forming discrete ice crystals, separating them from coffee

extract by centrifugation and washing the crystals with fresh water. On the basis of the above differences between orange juice and coffee extract, the Flosdorf '677 patent is not prior coffee art.

The Flosdorf 2,509,681 ('681) Patent Does Not Disclose the Invention Claimed in Muller '007 (Answering Nestle Br., pp. 8-9)

33. The Flosdorf '681 patent discloses freeze concentration of coffee extract and states that such a method is known and requires no further description. Freezing means solidification of the solvent. The Flosdorf '681 patent merely discloses the freezing of coffee extract and solidification of the solvent (water). However, solidification does not mean formation of discrete ice crystals. Ice could be pure water ice crystals or amorphous solidified water or

agglomerated ice crystals with occluded dissolved material. Silence on this point would be expected in the prior art for the reasons stated above with reference to crystal formation in the freeze concentration of coffee. Flosdorf did not expect to obtain ice crystals. The formation of ice crystals of the type set forth in Muller '007 provides that the coffee extract adhere to the surface of the crystals from where it can be washed off and recovered. On the other hand, dissolved solids occluded in an aggregate of ice crystals or in the lattice of the ice crystals cannot be washed off and are not economically recoverable.

34. The effect of this fundamental difference between discrete ice crystals and plain non-crystalline ice was not understood in the prior art. For example, Sivetz (Tab U, p. 15) presents a

phase diagram for coffee extract. The diagram clearly indicates that the solid phase (ice) has a very high content of coffee solids and that the solids are occluded in the solid phase (ice). Thus, even in 1963 (the date of publication of Sivetz' book) after Flosdorf, the art was not clear on how water from coffee extract solidifies and, in any event, certainly did not disclose how to obtain unoccluded ice crystals. The Muller '007 patent teaches the formation of unoccluded discrete ice crystals. This is not found in Flosdorf '681.

35. With respect to concentrations, the Muller '007 patent clearly states just what feed (10 percent - 30 percent) and final concentrate (30 percent - 50 percent) are required. Flosdorf '681 gives no indication of the initial concentration, The statement in column 8, lines 9-13 simply expresses the desire of

having a final coffee extract with a concentration of 50 percent dissolved solids for optimum results. Flosdorf does not disclose that pre-concentration to 50 percent solids can be achieved by freeze concentration or how such freeze concentration step is to be accomplished.

36. Furthermore, the Muller '007 process involves separation of ice crystals by centrifugation, freezing of the concentrated extract to a solid mass and freeze drying it to 1-5 percent moisture at zero degrees to -45°C. None of these critical steps and operating conditions are disclosed by Flosdorf '681.

Irwin 2,292,447 ('447) and Colton 2,751,687 ('687) Do Not Disclose the Invention of Muller '007
(Answering Nestle Br., p. 11, 17 fn.)

37. The Irwin '447 and Colton '687 patents disclose freeze drying in general terms without the critical conditions

enumerated above as claimed in Muller '007.

38. By contrast, the Muller '007 patent discloses freeze concentration of coffee extract under controlled conditions with respect to initial and final concentrations and formation and separation of discrete ice crystals. This process whereby, nonoccluded ice crystals are obtained, is not conventional for coffee extract or obtainable by the procedures disclosed by Irwin and Colton. Furthermore, the '007 patent clearly and critically defines the moisture content (1-5 percent) in the final product and the temperature (zero degrees to -45°C.) for freeze drying coffee.

39. As noted above (¶ 20), the 1-5 percent moisture in the final product is a critical specification of the final product. Any attempt to reduce the

moisture to less than 1 percent by prolonged exposure of the coffee to high temperature would damage the quality of the coffee due to the removal of volatile aromatic components. On the other hand, allowing a moisture content higher than 5 percent of the final product would give a product of limited storage stability.

The Noyes 2,416,945 ('945) Patent is Not Prior Art with Respect to Muller '007 (Answering Nestle Br., pp. 11-12)

40. The Noyes '945 patent discloses a technique for concentrating coffee extract by: (a) freezing the extract to a solid frozen mass and (b) slowly warming the frozen mass until a mixture of ice and concentrated extract are formed. This patent clearly indicates that freeze concentration can be achieved by different techniques. Muller's step by step process must be clearly understood in comparing various

processes. All processes which concentrate coffee extract by freezing cannot be assumed to be one and the same process.

41. In particular, the '007 process does not involve a step for freezing the feed coffee extract (10%-30%) to a solid mass. The '007 patent teaches the formation of the discrete ice crystals within the liquid extract. Moreover, Noyes '945 provides for concentrating very dilute extract. Noyes' infusion is concentrated to 15-20% dissolved solids whereas the final concentrate of the '007 process is 30%-50% solids.

The Cortez 2,852,388 ('388) Patent Does Not Disclose the Inventions of Muller '007 (Answering Nestle Br., p.11)

42. The Cortez '388 patent discloses a process for preparing a tea concentrate by a heating method and subsequently freezing it quickly in order to preserve

its aroma and flavor. There is no intention to freeze concentrate the tea extract. This process is not a freeze concentration method and it has no meaning in relation to the '007 patent or any of the other patents involved in this litigation.

Bassett 529,202 ('202) is Not Prior Art as to Muller '007 (Answering Nestle Br., p. 16)

43. The Bassett '202 patent refers to dilute solutions which could be less than 10% coffee solids. Nowhere does Basset disclose any concentrations of 10-30% coffee solids. The coffee infusion as prepared by Bassett is similar to coffee made in a household percolator and such coffee solutions normally have less than 5% coffee solids.*

---

* See also my Group II affidavit, ¶ 10.

Walker 3,156,571 ('571) is Not
Prior Art as to Muller '007
(Answering Nestle Br., p. 60)

44. The Walker '571 patent discloses a process for making orange juice. The same arguments as for Flosdorf '677 are valid. Furthermore, the Walker '571 patent does not disclose the recycling of the washings as was pointed out by Nestle (Nestle Group I Mem., p. 60). It discloses the recycling of concentrated liquor and recovery of solids from the melted ice by evaporation (not from the washings).

Findlay 2,945,903 ('903) is Not
Prior Art as to Muller '007
(Answering Nestle Br., p. 62, fn.)

45. The Findlay '903 patent discloses a process for recovery of paraxylene by fractional crystallization. As was indicated above in comparing orange juice and coffee extract, the chemical composition of the

solvent and materials involved in crystallization have a profound effect on the habit, size and size distribution of the crystals produced and their subsequent separation from the concentrated liquor. Thus, attempting to extrapolate data and concepts from a paraxylene process to coffee extract is considered a futile and improper exercise.

Cole 2,967,778 ('778) is Not Prior Art as to Muller '007
(Answering Nestle Br., pp. 16, 61)

46. The Cole '778 patent discloses freeze concentratio of dilute orange juice. No comparison can be made to the high concentration involved for freeze concentrating coffee extract by the '007 process.

Bedford 2,354,663 ('663) is Not Prior Art as to Muller '007 (Answering Nestle Br., p. 61 [cited in quotation from Sperti case])

47. The Bedford '663 patent discloses washing with liquor for the freeze concentration of orange juice. In the case of coffee extract, the washing with coffee liquor is not feasible. The '007 process uses fresh water for washing.

Food Engineering and Freezing Preservation are Not Prior Art as to Muller '007 (Answering Nestle Br., p. 62)

48. The Food Engineering (Tab S) and Freezing Preservation of Foods (Tab T) references describe processes related to food products other than coffee and are not related to the '007 process.

Ganiaris 3,283,522 ('522) Is Not Prior Art as to Muller '007 (Answering Nestle Br., pp. 33, 63-67)

49. The Ganiaris '522 patent discloses only freeze concentration of

coffee extract and simply mentions the application of the technique for preparing instant coffee. It should be understood that instant coffee could mean any one of several coffee products such as frozen concentrate, low temperature spray-dried coffee, high temperature spray-dried coffee, freeze dried coffee, agglomerated coffee or any mixture of two or more of the above coffee products. The Muller '007 patent discloses a specific freeze dried coffee product which is produced by a specific freeze concentration freeze drying process, not any freeze concentration freeze drying process.

Vogt 1,783,864 ('864), Vogt 1,847,149 ('149) and Miller 2,023,607 ('607) are Not Prior Art as to Muller '522 (Answering Nestle Br., p. 65)

50. The Vogt '864, Vogt '149 and Miller '607 patents disclose a device

which is used primarily as a heat exchanger in the food industry for a very limited number of crystallization processes. However the use of this device for ice crystallization from a coffee extract was not known and its application is not a matter of routine experimentation. Coffee extract must be freeze concentrated quickly and its residence time in the crystallizer should be short. Otherwise, a precipitate of coffee solids form and plugs the centrifuge screens (filter medium). On the other hand, a certain volume is required to give time for ice crystal growth. Therefore, a tank crystallizer is not suitable for these purposes while Muller's '522 invention does the job in the manner required.

51. The Muller '522 patent discloses an apparatus system for transforming a liquid coffee extract to a dried

product. None of the cited references disclose all the components and their interrelationship as claimed in '522.

The Claims of Muller '522 are Valid
(Answering Nestle Br., p. 74)

52. The apparatus claimed in Muller '522 can be used for a variety of processes other than the one described in '007. The apparatus also can be used to concentrate and subsequently dry very dilute coffee or tea extract (less than 10% dissolved solids). The apparatus can be used to concentrate a coffee extract (from 5% to 50% dissolved solids) and subsequently dry the concentrated extract to a final product with less than 1% moisture. This apparatus is not limited to the critical operating (10% - 30% to 30% - 50%) conditions of the '007 process or product (1-5% moisture), or to maintaining the frozen mass temperature

in the range of 0°C to -45°C during the freeze drying cycle.

The Claims of Muller '007 and '522 are Valid Under 35 U.S.C. § 112 -- First Paragraph (Answering Nestle Br., pp. 75-78)

53. The '007 specification discloses clearly that the concentrated extract is frozen to -40°C (within the claimed range of 0°C to -45°C; col. 4, line 64) and the ice is sublimed. A person skilled in the art knows that in order to remove all the frozen water by sublimation, the frozen mass of extract must remain frozen during the entire process cycle. Thus, Muller '007 has specified a temperature range (0°C. to -45°C.) in his claims as filed which shows that the coffee extract must be kept frozen within that temperature range during freeze drying. The coffee solids are generally subjected to pressures in the range of about 200 to

250 microns during freeze drying.

54. If the concentrated coffee extract is frozen in a tray, the top surface will be dried first while at the bottom the extract will be frozen. Thus, the top surface could easily be overheated to over 100°F. and, in turn, cause the evaporation of volatile aromatic compounds and deterioration of the flavor.

55. Furthermore, Example 1 clearly states the time required for achieving a dried product with 1-5% moisture. The moisture content of the final product is a very critical specification. A moisture content of less than 1% results in the loss of volatile aromatic components due to over drying; it takes considerable time and heating to reduce the moisture to less than 1%. On the other hand, if the moisture content is over 5%, the storage stability of the

product is limited. For a commercial product, which might be stored for several months, it is critical that its quality not deteriorate.

56. With reference to the Muller '522 patent, Example 1 clearly outlines a process to be used with the '522 apparatus. The process disclosed in this example is similar to the '007 process. However, as shown above, the apparatus can be used with other processes.

The Claims of Muller '007 and '522 are Valid Under 35 U.S.C. § 112 - Second Paragraph (Answering Nestle Br., pp. 78-79)

57. The claim language is clear for the same reasons outlined above. A person skilled in the art of the manufacture of soluble coffee products could easily produce coffee by following the procedure dictated by the claims of

'007 or by using the apparatus dictated by the claims of '522.

The Features of the Muller '007 and '522 Claims Were Not Offered For Sale More Than One Year Prior to Their Effective Filing Date (Answering Nestle Br., pp. 42-50, 85-88)

58. The applications for the '007 and '522 patents were filed or effectively filed on January 28, 1966. Accordingly, any sales which would be a statutory bar to their validity would have to have taken place prior to January 28, 1965.

59. The only sale by Struthers to General Foods prior to January 28, 1965 was pursuant to an agreement dated August 12, 1964. That agreement did not provide for any freeze drying apparatus, process technology or know-how. Struthers, for example, did not sell

> "subjecting said more concentrated extract to relatively complete dehydration by freezing the extract

> to a solid mass and freeze drying to a moisture content of about 1 to 5 percent at temperatures between about 0° to -45° C.

as set forth in claims 1(d)* of the '007 patent, nor did Struthers sell the combination of claim 1(d) with the remaining steps of that claim.

60. Nor, for example, did Struthers sell either

> "freezing means for freezing the extract;" or
>
> "means for removing moisture under vacuum from frozen extract by sublimation;"or
>
> "heat source means coacting with vacuum means for heating and drying the frozen extact."

as set forth as subparts (d), (e) and (f) in the '522 patent. The combination of claims 1(d), (e) and (f) with the

---

* The original patent statement as to a temperature of -50°C. was subsequently amended to -45°C.

remaining elements of that claim was likewise not sold to General Foods.

s/Neophytos Ganiaris
NEOPHYTOS GANIARIS

Sworn to before me this
11th day of May, 1981

s/Adam B. Gilbert
Notary Public

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION,	
Plaintiff,	Civil Action No. 663-72.
v.	
THE NESTLE COMPANY, INC.,	AFFIDAVIT IN OPPOSITION TO NESTLE'S MOTION
Defendant,	FOR PARTIAL SUMMARY JUDGMENT
v.	(GROUP II)
STRUTHERS WELLS CORPORATION, and STRUTHERS SCIENTIFIC AND INTERNATIONAL COPORATION,	
Additional Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. I reaffirm and include herein by reference all statements made in my Group I affidavit. I make this affidavit in opposition to Nestle's motion for partial summary judgment of invalidity and/or unenforceability of Ganiaris patents 3,531,295 (the "295 patent") and 3,620,034 (the "034 patent"), also known as Nestle's "Group II motion."

Introduction to Recovery of Coffee Solids

2. After centrifugation to separate the ice crystals from the concentrated coffee extract, the exterior surfaces of the ice crystals in the centrifuge are coated with coffee extract. Coffee

solids are not occluded in these ice crystals and can therefore be washed and further centrifuged to remove the extract from the surfaces of the ice crystals, with coffee solids being recovered from the wash solution. This can be accomplished by returning melted ice crystals and coffee extract adhered thereto to the coffee extractor or by removing coffee directly from the melted ice. Recovery of the additional ice surface coffee extract is very important economically because coffee is very expensive and use of Struthers' system can increase extracted coffee solids by about 5%. The foregoing background is necessary to my discussion of prior art,

infra. Before turning to prior art, I will address certain of Nestle's initial arguments.

Ganiaris '295 and '034 Are Not Invalid by Reason of Struthers' Offer for Sale (Answering Nestle Group II Mem. [hereinafter Nestle Br.] pp. 20, 63-64)

3. The subject matter of the '295 and '034 patents were not sold to General Foods Corporation ("General Foods") more than one year before the filing of the applications for '295 and '034 or before my invention thereof. The sales contract between Struthers and General Foods dated August 12, 1964 does not mention that the loss of coffee solids is related to coffee solids in the ice or that the ice

should be recycled to recover solids or that any attempt should be made to recover the coffee solids from the melted ice. Indeed, the equipment and system as supplied to General Foods in 1964 had no provisions for the recovery of coffee solids from melted ice. Melted ice was considered waste.

4. The answers to General Foods' interrogatories (noted in Nestle Br., p. 45-48) in the Delaware litigation do not indicate that recovery of coffee solids from the melted ice was incorporated in the FreCon system sold to General Foods in 1964. Struthers only disclosed to General foods that recovery of coffee solids, and recycling of melted ice to

extractors, evaporators, spray-dryer, is possible.

Ganiaris '295 Is Not Invalid
Under 35 U.S.C. 102(f)
(Answering Nestle Br., pp. 34-38)

5. Nestle claims that I am not the inventor of the '295 invention. Nestle is not correct. I am the inventor. I disclosed the invention to General Foods during several meeting with their engineers sometime in 1965.

6. The "confidential" memorandum (relied on by Nestle [Br., pp. 5-6]) does not say that General Foods gave the idea to me. It simply states that General Foods intended to implement the concept. General Foods decided to adopt the

Ganiaris invention because it wished higher yield immediately. The idea was mine and not derived from General Foods.

Ganiaris '295 Is Not Invalid Over the Prior Art (Answering Nestle Br., pp. 39, et seq.)

7. Sivetz (Nestle Tab R) does not show steps (a), (b) and (c) of claims 1 and 3 of the '295 patent. He simply mentioned the operations involved without showing the interelationship required for the process to function. For example, on page 15 of the Sivetz reference, he shows a phase diagram which clearly indicates that the ice-phase has large quantities of occluded coffee solids. If this phase diagram were correct, centrifuging and

washing would not purify the ice beyond the limits set by the equilibrium lines. Struthers' research has proven that pure discrete ice crystals can be grown in coffee solutions without any occlusion. There is no prior art (patents, publications or anything else) which shows what Struthers discovered and disclosed in patents with respect to this phenomenon.

8. Again, on page 16, Sivetz shows a flow diagram of a freeze concentration process for concentrating coffee extract from 25% solids and removing the ice phase with 1% solids in the ice phase. However, this diagram does not show centrifugation (or indeed any other ice

separation technique).

9. On pages 16-19, Sivetz makes several unrelated general statements which have no meaning in relation to the '295 patent. Sivetz states that "sharp separation of ice and more concentrated coffee is obtained with large ice crystals which entrain little extract in centrifuge separations" (Tab R, p. 16) and that "large ice crystals make for efficient separation of ice from the concentrated coffee solution" (Id., p. 17). On the other hand, Sivetz makes the following statements:

a. There is hardly any literature on the growth of ice crystals in suspension (Id., p. 17).

b. The ice crystals also occlude extract (Id., p. 17).

To the extent that the ice crystals occlude coffee solids, the efficiency of separation of coffee extract from ice is limited. The '295 patent, however, clearly discloses that discrete ice crystals can be grown in extract comprising more than 20% coffee solids and these ice crystals can be purified to less than 5% coffee solids.

10. The Bassett 529,202 ('202) patent (referred to by Nestle [Br., pp. 39-40]) discloses a process involving

a. freezing the extract in a mold and separating concentrated extract by reversing the mold; and

b. crushing the ice and subjecting it to centrifugation.

It is clear that in this process there is no intention to form discrete ice crystals in suspension of the extract solution, whereas the '295 process forms discrete ice crystals and there is no need for crushing the ice prior to centrifugation. In addition, the infused solution is diluted considerably lower than the limits (15% - 30%) set in '295 for the feed extract.

11. Nor does Bassett show that the crushed ice solid mass can be purified to less than 5% coffee solids. If Sivetz' phase diagram were correct, and this was the industry opinion at the time, one

would expect the ice solid mass to have occlusion of 15% which can not be reduced by washing in a centrifuge.

12. The melted ice in Bassett '202 is a weak solution. There is no data in the prior art to indicate that a weak solution has less than 5% coffee solids. As a matter of fact, Sivetz, who provided the only phase diagram available, indicates that if Bassett freezes his infusion to -10°C, the ice phase will have an occlusion of at least 15% coffee solids. The limit of 5% can be achieved only if the ice crystals are formed as pure discrete ice crystals (substantially no occlusions) in accordance with steps (a) (b) and (c) of the '295 patent.

13. Lund 3,205,078 ('078) (next referred to by Nestle [Br., p. 42]) refers to orange juice.* Phase diagrams relating to orange juice and other fruit juices were clearly known and indicated that pure discrete ice crystals (no occlusions) could be formed (Nestle Group I Exhibits, Tab T, p. 602). But such a phase diagram or freezing curve did not exist for coffee in the prior art. Sivetz' diagram is the only one available, and as stated above not only did it not make the disclosures of the '295 patent, but his treatise stated that coffee would be occluded in the crystals (see ¶¶ 7-9, supra).

15. Sperti 2,588,337, Walker 3,156,571, Cole 2,967,778 and Bedford

---

* As stated in my affidavit for Group I, results from orange juice cannot be extrapolated to coffee. The recycling of melted ice in Lund only applies to orange juice.

2,354,633 (referred to by Nestle [Br., p. 42]) refer only to fruit juices and are not applicable for the reasons previously set forth in respect to orange juice. (See my Group I affidavit at ¶¶ 21-24).

16. Bilenker 2,949,364 (referred to by Nestle [Br., p. 42] refers to cold extraction. The percentage of coffee solids in the ice is not important because there is no melting and subsequent heating to high temperatures (250°F), Bilenker, therefore, is not a pertinent reference.

17. Svanoe 3,347,058, Svanoe 3,295,021, Pike 3,285,022, and Ganiaris 3,283,522 ('522) (Nestle Br., pp. 42-43) do not disclose recycling melted ice to the extractor.

18. In short, none of the prior art references cited by Nestle and discussed in ¶¶ 7-17 above disclose the complete combination of steps as claimed in '295.

The '295 Patent is not Invalid
Under 35 U.S.C. § 102(d)
(Answering Nestle Br., pp. 48-51)

19. The Struthers' French patent 1,419,922 ('922), which relies upon priority of Ganiaris '522, discloses a process for freeze concentrating coffee extract. The system can be defined by three streams:

a. Feed (dilute extract);

b. Product (concentrated extract); and

c. Ice (effluent from the plant)

20. Regardless of how the system is operated, there is one stream (feed) entering the plant, another stream (product) leaving the plant and an ice stream leaving the plant. The ice stream leaving the plant cannot be recycled back to the plant for the recovery of coffee solids. Any attempt to recycle this ice stream will defeat the purpose of concentration. The '295 patent, on the

other hand, discloses a process which teaches the recycling of melted ice (the effluent stream from a freeze concentration plant) either to the extraction process or to some other process for recovering the coffee solids. In short, the Struthers' French '922 patent refers to internal recycling (within the freeze concentration system), whereas the '295 patent refers to external recycling (outside the freeze concentration system).

21. The foregoing differences between the '922 and '295 patents are critical. In the case of the internal recycling, the quantity of coffee solids in the effluent ice stream could be 10-15% without any effect on flavor because all streams are maintained at low temperatures. On the other hand, the external recycling concept of '295 contemplates heating at high temperatures

(extractor or spray drier, etc.) and the coffee solids in the ice must be below 5% in order to avoid flavor and aroma deterioration.

Ganiaris '034 is Not Invalid Over Prior Art
(Answering Nestle Br., pp. 51, et. seq.)

22. The Ganiaris 3,620,034 patent (the "'034" patent) discloses a process with at least two crystallization stages. In addition, the weight percentage of ice crystals in the crystallizer is limited to the range of 20-30%. In every crystallizer, the following processes occur simultaneously:

a. Nucleation; and

b. Crystal Growth

The rate of nucleation should be in balance with the rate of growth; otherwise, excessive nucleation will result in a slurry of very small crystals. In the case of coffee extract,

it was found that in order to minimize the nucleation rate, it is necessary to provide a sufficiently large ice crystal surface area in the crystallization zone (20-30% by weight of ice crystals). With the foregoing in mind, I turn to Nestle's specific references.

23. The Ganiaris '295 patent (cited by Nestle [Br., pp. 58-60]) discloses a process without any limitation to the number of the crystallization stages. The weight percentage of ice crystals of '295 in the crystallization zone could be 10-15% or even 35-40%, etc.

24. The Ganiaris '522 patent (cited by Nestle [Br., p. 61])does not disclose the requirement for maintaining 20-30% ice crystals by weight in the crystallization zone.

25. Tne Kellogg 2,408,260 patent (cited by Nestle [Br., p. 61]) discloses a process for freezing the extract and

then crushing the solid ice mass prior to centrifuging, whereas the '034 patent discloses the formation and growth of discrete ice crystals in suspension which can be separated from the concentrated extract without any other treatment (crushing, etc.) prior to centrifugation.

26. The Berger 2,896,418 patent (Nestle Br., p. 61) does not disclose a process for forming discrete ice crystals with a 20-30% ice crystal content in the crystallization zone and with at least two stages for crystallization. It is not comparable to the '034 process.

27. Lund 3,205,078 patent (Nestle Br., p. 61) discloses a process for freeze concentrating fruit juices. Coffee is mentioned as a possible application without giving any processing details. Extraction of pulp (orange juice) does not involve the high

temperatures required for the coffee extraction process.

28. Svanoe 3,285,021 patent (Nestle Br., p. 61) discloses a process where the crystallization tubes are connected in parallel, whereas, the '034 patent discloses a process wherein the crystallizer passes are serially connected. This distinction is critical, for it avoids the necessity to distribute the flow of the feed to the crystallizer and prevents freeze ups in the tubes.

29. Pike 3,285,022 patent (Nestle Br., p. 61) discloses a process for vegetable and fruit extracts. Coffee extract is not mentioned in the specification or the claims. Indeed, the concentrations of the various streams are all with reference to fruit juices. That Pike mentions one of the operating conditions of the '034 process (25% ice crystals) is not a disclosure of the

entire process or even the single step for coffee.

30. Svanoe 3,347,058 patent (Nestle Br., p. 61) discloses only one operating condition of the '034 patent, whereas the '034 process involves several steps. Moreover, Svanoe separates the freezing zone from the crystal growth zone, such that his operating conditions cannot be applicable to '034.

31. Cole 2,967,778 patent (Nestle Br., p. 61) discloses a process for orange juice and, as was shown in my Group I affidavit, the processing conditions and the order of performng each step are not applicable to coffee.

The '295 Patent is Not Invalid Under 35 U.S.C. § 112

32. Nestle's Br. p. 27 indicates that the '295 specifications states a process for recycling the melted ice to

the extraction step. Furthermore, on p. 28, it is stated that there is no hint in the specification of doing anything else with the melted ice.

33. However, it appears from the description of the process in the specification that the only reason for recycling the melted ice to the extraction is to recover coffee solids from said melted ice (Id. 3, p. 36 to 44). There is no other reason to recylce the melted ice to the extraction. If someone could invent an efficient and economical process to remove the ice crystals from the system without any adhering coffee solids (zero), there will be no reason to recycle the melted ice to the extraction step.

34. The specification, therefore, discloses a proces for recovering coffee solids from the melted ice. Recycling the melted ice to the extraction is only

one possible application. The spirit of the invention is to recover the solids from the melted ice which has been generated as a result of the processing steps (a) through (e).

The '034 Patent is Not Invalid Under 35 U.S.C. § 112

35. The two specifications are exactly the same. The specification of '034 discloses all the process conditions of the British Provisional Application; including the flow diagram shown in the drawing.

36. There is no question that the specification of '034 and of the British provisional application are the same (see Nestle's Br. p. 57). Therefore, the question is whether or not the Claim 1 of '034 is described in the specification.

37. According to Claim 1, a concentrate of coffee is prepared from a

liquid containing about 24% coffee solid by

step (a) partially freezing aqueous coffee extract in at least two serially connected crystallizer passes to form a mixture of about 20-30% by weight ice and a concentrated extract.

38. Therefore, the first step of the process is to form a mixture of about 20-30% by weight ice crystals and concentrated extracted by partial freezing of a feed solution with about 24% coffee solids.

39. The '034 patent and the British specifications clearly indicate that concentrated extract from crystallizer 14 has a concentration of 26% to 30% coffee solids. By material balance, one can easily show that if the feed solution has 24% coffee solids and the concentraction

solution 30% coffee solids the efficient mixture from the crystallizer is 20% by weight ice crystals.

40. The recycle of mother liquor (concentrated extract) via pipe line 38 is required only for control purposes to adjust the percentage of ice crystals in the efficient mixture from the crystallizer to 20-30% by weight. If the feed solution is 24% coffee solids, the recycle stream (pipe line 38) is zero. Therefore, no enrichment of the feed to the crystallizer is necessary. In Ex. 7, p. 0024, the British Prov. Appl. clearly states that circulation of mother liquor (pipe line 38) should be balanced and controlled so that the percentage of ice crystals by weight in solution in cyrstallizer 14 is between 20-30%.

41. Nestle's Br. pp. 55, attempts to imply that the British application requires enrichment of the dilute feed.

(13% to 24%) prior to feeding it into crystallizer 14. However, the British application states very clearly also that the slurry effluent from the crystallizer 14 should be 20%-30% by weight ice crystals. A person skilled in the art can easily calculate that if the dilute feed is 24% coffee solids, there is no need for enrichment (mother liquor recycle via pipe line 38 is zero).

42. Nestle's Br., p. 56, states that Claim 1 of '304 patent makes no provision for enrichment of the liquid which contains 24% solids prior to freeze concentration. As it was explained above, there is no need for such a provision, No enricment is required if one must maintain a 20-30% ice slurry.

43. In summary, the Claim 1 of '034 is fully disclosed in the specification of '034 and of the British application. Therefore, Claim 1 of '034 can have the

benefit of the British application filing date (July 15, 1966).

s/NEOPHYTOS GANIARIS
NEOPHYTOS GANIARIS

Sworn to and
Subscribed before
me this 11th day
of May, 1981

s/Adam B. Gilbert
Notary Public

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION,	
Plaintiff,	Civil Action No. 663-72.
v.	
THE NESTLE COMPANY, INC.,	AFFIDAVIT IN OPPOSITION TO NESTLE'S MOTION
Defendant,	FOR PARTIAL SUMMARY JUDGMENT
v.	(GROUP III)
STRUTHERS WELLS CORPORATION, and STRUTHERS SCIENTIFIC AND INTERNATIONAL COPORATION,	
Additional Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. I reaffirm and include herein by reference all statements made in my Group

I and Group II affidavits. I make this affidavit in opposition to Nestle's motion for partial sum mary judgment of invalidity and for unenforceability as to the Reimus et al. patents Nos. 3,381,302, 3,449,129, 3,632,353 and 3,474,723 (the "Group III motion").

Introduction to Dewaxing

2. In the manufacturing of instant coffee, the qual ity (flavor and aroma) of the final product depends mainly on two factors:

a. Quality of the coffee beans; and

b. Processing techniques.

3. The first steps in processing are blending the coffee beans, roasting the beans, and extraction of coffee solids from the beans (in the extractor). These processing procedures are dependent upon the experience and

judgment of the operators. Manufacturing a good quality instant coffee is an art.

4. The quality of the coffee extract leaving a commercial extractor will vary from one plant to another, and will even vary within the same plant from one batch to the next. All such coffee extract contains "waxy" types of material which vary in quantity and chemical composition depending upon the processing techniques for preparation of the coffee extract and the type of coffee beans in the blend. The "waxy" types of material are polymeric substances produced primarily by hydrolysis at 250 degrees to 350 degrees F. during extraction from the beans. The exact chemical composition of the "waxy" substances is very complex and cannot be defined in any precise manner because it varies substantially depending on the variety of beans. But it has been clear for some time that "waxy" types of

material degraded the taste of the coffee by removing certain natural oils therefrom, gummed up the centrifuge used in separating ice from the coffee extract and caused specks on the coffee cup. Thus, it is very advantageous to prepare the extract in a way which removes precipitates of the waxy materials.

5. In general, a coffee extract prepared at high temperatures (250 degrees to 350 degrees F.) will have these "waxy" materials (approximately 5%), whereas an extract prepared only with hot water (up to boiling)* will have

---

* A coffee solids concentration of less than 10% of the weight of the beans is normally obtained at this range. Commercial extraction must take place at higher ranges to derive higher solids content to obtain the maximum feasible amount of product. Coffee solids concentration of 35% of the weight of the extract can be and are obtained.

a very low content of some different types of of wax-like material. High temperatures (resulting in hydrolysis) are used in commercial extraction in order to extract more solubles from the coffee beans.**

6. Therefore, a coffee extract produced with boiling or lower temperature water (as described by many patents in the prior art relating to preparation of an infusion) is of a higher uality than the coffee extract produced in a commercial extractor at higher temperatures, which is the type of extractor referred to in the Group III Reimus patents. The Reimus patents disclose a technique which results in a

---

** Basically, in extraction, certain substances (cellulose and others) which are insoluble in water are converted chemically (by hydrolysis) at high temperatures to water soluble substances.

product which, though it has been subjected to high temperature extractors, has a quality approaching that of extract only subject to low temperature extractors.

7. In every manufacturing plant, the objective is to achieve the highest quantity of solubles from a pound of coffee beans (thereby reducing the unit cost of raw material) without any degradation of the taste and flavor of the final product.

8. To meet this objective at the time the applications for the Reimus patents listed in the Nestle Group III memorandum were filed, it was necessary to clarify (by centrifugation) the hot extract leaving the extractors in order to remove a "sufficient" quantity of the "waxy" substances to minimize "specks" and "rings" on the coffee cup so that the coffee would have a "clean" appearance.

Thus, the two key tests performed after extraction were empirical.

a. Taste tests by panels of individuals; and

b. Clean cup tests, so that there are no specks or rings in the cup.

There was nothing scientific about these tests. As long as a sufficient" quantity of "waxy" materials was removed to meet the taste and clean cup tests, the extract was satisfactory.

9. While Struthers' new system solved the problems caused by the old techniques (see ¶¶ 5-6 above), resulting in an extract with much less of the old type of "waxy" substance and an extract from which a coffee with improved taste ultimately emerges, several new problems (not experienced in the prior art) with respect to the "waxy" materials had to be solved.

a. By lowering the temperature of the extract below 80 degrees F., a precipitate was formed, even from extract that had already been clarified at high temperatures. The precipitate was deposited on the centrifuge of the "FreCon process" (thereby "gumming it up") preventing the efficient separation of ice crystals from concentrated extract.

b. This precipitate would also cause formation of unwanted specks and rings in the coffee cup after brewing instant coffee; and

c. Removal of the precipitate by any means was not desirable because it resulted in a loss of coffee product.

10. The Reimus inventions

offered solutions to these problems. First, Reimus recognized differences between the "waxy" materials that were removed at high temperatures (over 100 degrees F.) and the precipitate that was formed at low temperatures (80 degrees to 32 degrees F.). Reimus found that

a. The low temperature precipitate was a mixture of "waxy" materials (with no effect on taste) and coffee components which were needed for making a good quality (flavor and aroma) product; and

b. The ratio of the "waxy" materials to the "desirable" coffee components in the precipitate depended on the cooling technique of the extract.

11. After having recognized these differences, Reimus offered specific solutions as seen in his patents. The

Reimus inventions have been used in industrial applications for manufacturing millions of pounds of coffee. Furthermore, his inventions were not obvious, even to people closely involved with the freeze concentration and freeze drying technology related to coffee at the time the inventions were made. Reimus' discovery that the precipitate was a mixture of "waxy" materials and "desirable" coffee solids and his method of wax removal were true contribution to the art.

There is No Double Patenting of a Single Invention (Answering Nestle Group III Mem. [hereafter Nestle Br.] pp. 55-60)

12. The '302 patent teaches that cooling of the extract to 32 degrees to 45 degrees F. and holding it for a proper time will remove substantially all the waxy materials while retaining the coffee

solids that enhance the flavor of the product.

13. Reimus '129 discloses the removal of the "waxy" materials should be done at 45 degrees to 80 degrees F. if the holding period is longer than that contemplated by the '302 patent. Reimus was the first to recognize that the flavor desirable coffee solids do not precipitate in appreciable quantities within that temperature range. The precipitate in that range is primarily "waxy" materials which can be removed with substantially no adverse effect on product quality.

14. The '129 invention is very desirable whenever the operator is forced to hold the extract for prolonged periods due to equipment breakdown or other inefficiencies in the plant. In practice, the '302 process must be used in order to avoid plugging the

centrifuge, preventing the removal of desirable coffee solids and causing system shut-down to clean the "waxy" material from the centrifuge. However, whenever the feed coffee extract must be kept for prolonged periods of time (beyond the control of the operator), the '129 process is used.

15. Under normal operation, the extract is cooled to 32-45 degrees F. for a specific period (about 1 hour). If the operator is forced to keep the extract for 4-8 hours due to equipment breakdown, it is necessary to practice the '129 process for 3-7 hours and use the '302 process for only one nour. Thus, the desirable coffee solids which affect flavor are prevented from precipitating.

16. The '129 patent, therefore, discloses a different process from that taught by '302 because '129 teaches the precipitation and removal of "waxy"

materials and prevention of the removal of desirable coffee solids that might affect flavor for the reasons stated above. It also relates broadly to dehydration and not just to freeze concentration.

17. Reimus '353 is a further improvement over Reimus '129. The '353 patent discloses the temperature range of 80 degrees F to 36 degrees F for a 24% extract. If a 24% extract is held for many hours at 32-45 degrees F ('302 patent) the flavor will deteriorate due to excessive precipitation of desirable coffee solids. If a 24% extract is not cooled below 45 degrees F ('129 patent), the "waxy" materials cannot be removed completely in order to avoid plugging of the centrifuge. Furthermore, the '353 patent teaches that a 24% extract can be cooled to 36 degrees F. and avoid both

problems (flavor deterioration and centrifuge plugging).

18. The '723 patent refers to an apparatus which can be used with products other than coffee extract (for example, tea). It is not limited to the temperatures or concentrations disclosed in '302, '129 or '353. In addition, (1) the pre-cooling and holding means and separation means are accomplished in separate devices, whereas the '302, '129 and '353 do not require cooling and holding in separate devices; (2) the crystallizer is specified to be a tubular one, whereas ice crystallization can be accomplished in other types of crystallizers; (3) the '302, '129 and '353 processes can be carried out by different cooling means (heat exchanger), holding means (a tank) and separation devices (filter or centrifuge). In short, the '302, '129 and '353 processes

can be carried out in an apparatus such as in '723, but these processes can also be carried out in a large variety of other devices.

The Reimus Patents Are Not Vague or Indefinite to One Skilled in the Art (Answering Nestle Br. pp. 67-73)

19. In practice, the teaching of the '302 patent is clear, and the terms "sufficient" and "substantially" are not vague. One skilled in the art knows that the type and quantity of "waxy" materials in the extract will vary, depending on the blend of coffee beans and the processing techniques used during roasting and extraction; any precise numerical definition of the quantity is neither important nor meaningful. The important point is that the Reimus patents teach how coffee extract can be clarified sufficiently (with minimum removal of coffee solids) to avoid specks

and rings on the coffee cup and plugging of the centrifuge without adverse effect on flavor.

20. Nestle argues that the Reimus '302 and '129 patents failed to be sufficiently specific because time for holding is not specified (Nestle Br., pp. 67-69). However, the quantity of precipitate formed is a function of time and temperature. In practice, the operator of the coffee manufacturing plant has no absolute control over time because the batches come in different size and are processed at irregular intervals. It is obvious that the first gallon of a 500-gallon batch can be processed immediately whereas the last gallon might be held for several hours prior to processing because, among other things, of the size of the equipment and the time it takes to cool the extract. (There is no such thing as

"instantaneous" cooling.) In addition, breakdown of equipment and other plant inefficiencies often force the operator to hold coffee extract in a storage tank for several hours. There is almost always a "holding" time beyond the operator's control.

21. On the other hand, the operator has absolute control over temperature. This operating condition is clearly specified by the '302 patent. In practicing the invention, the operator establishes a minimum level of precipitate that must be removed from each type of extract and the holding time required by performing a few routine tests and thus avoids flavor deterioration, centrifuge plugging, specks and rings.

22. The '129 patent teaches the cooling of the extract to 80 degrees F. to 45 degrees F., holding it in that

range of temperature and removing the precipitate without any adverse effect on flavor. In other words, the precipitate formed in this temperature range is primarily the "waxy" type of material but not the flavor-related oils. In practice, this invention is a great assistance to the operator. It tells him that if, for reasons beyond his control, he must keep the extract for longer periods of time than required at 32 - 45 degrees F., it is best to keep the temperature at 80 degrees F. to 45 degrees F. In this way, he would avoid the heavy precipitation of desirable coffee solids which have an enormously detrimental effect on flavor.

23. The '353 patent teaches the specific temperature range (80 degrees F. to 36 degrees F.) for cooling and holding a 24% extract. It is another invention from the '129 patent. By cooling 24%

extract to temperatures as low as 36 degrees F., the precipitate is primarily a "waxy" type material that can be removed without any substantial adverse effect on flavor.

24. The Reimus patents clearly disclose how to produce high quality coffee (even though elevated temperatures [250° F. to 350° F.] have been used) while producing the highly concentrated (10%-30%) coffee solids necessary for a commercial operation.

25. Both the '302 patent and the '129 patent clearly state temperature ranges: 32 degrees to 45 degrees F. and 45 degrees to 80 degrees F., respectively. The allegation that Reimus does not specifically claim 40 degrees F. (Nestle Br. p. 65) as an important temperature is incorrect. The 40 degrees F. is within the claimed '302 range and discussed at column 3, line 28.

26. In short, the Reimus patents do not give a number for holding time, because as explained above:

a. The holding periods vary with different coffee extracts; and processing techniques vary;

b. The "holding period" cannot always be controlled by the operator; and

c. The holding period can vary because of quality requirements. It is common practice in the industry to control every step of the coffee manufacturing process by "empirical" (meaning usually panel taste) tests, whereby one can establish the quantity of precipitate that affects taste for a specific extract.

In short, Reimus' teaching of the cooling temperature range is a meaningful guide to one skilled in the art to solve the problems. Duration was specified in

qualitative terms because the holding time varies with factors such as the chemical composition of the blend and the process used.

The Reimus Patents Are Valid Over Prior Art

27. Zorn 1,507,410 (cited by Nestle Br., pp. 8-12, 73-4) discloses a process for eliminating the undesirable elements which, upon standing, cause the chemical or other changes which break down the flavor of coffee concentrate. Reimus '302, on the other hand, discloses a process for eliminating the "waxy" materials to avoid the plugging of the centrifuge and preventing the removal of "desirable" coffee components.

28. The key question is whether the "undesirable" elements of Zorn are the same as those of Reimus. Obviously, neither patent discloses the composition

of these materials, because it is impossible to do so when dealing with a natural product reduced to extract by various techniques. However, from the specification of these patents, it is clear Reimus refers to an extract which has been produced by an entirely different processing technique from the infusion of Zorn. The Reimus extract has been produced at high temperatures (250 degrees F. to 350 degrees F.) and chemical reactions have caused the generation of polymeric substances which Reimus defines as tars or "waxy" materials. Reimus' concentrations of 10-40% dissolved coffee solids clearly indicate production of extract by hydrolysis (chemical reaction) which takes place only at high temperatures.

29. By contrast, Zorn's extract is an infusion produced with water which is hot but below the boiling point of

water. It is known that at such a temperature hydrolysis cannot proceed and, thus, the tars and "waxy" materials can not be produced.

30. The Zorn "undesirables" are therefore entirely different from the Reimus "waxy" type materials. The processes can not be compared because the materials to be eliminated and the reasons for removing them are entirely different. Indeed, Zorn discloses a process which, if applied to the coffee extract of Reimus, will cause precipitation and removal of most of the desirable coffee solids.

31. Zorn 1,636,890 patent (cited at Nestle Br., p. 28) discloses a process for eliminating the "undesirable" elements from fruit juices. This process is completely foreign to the coffee extract treated by the Reimus patent for

reasons stated in my Group I affidavit (¶¶ 21-24).

32. Rolle 2,234,063 (cited at Nestle Br., 8-9, 74) discloses the treatment of other substances, but doesn't mention coffee extract. Furthermore, there is no reference in the application (page 4, lines 11-15) to the quality of the product. Reimus '302 teaches the cooling to 32-45 degrees F., the removal of the "waxy" materials and the prevention of removing coffee solids which will affect the quality of the product, all of which Rolle does not disclose.

33. Tarasch 2,804,389 (cited at Nestle Br., pp. 7, 74) discloses a process for hardening a fat wax (by adding chemicals) within the coffee bean. This substance has no relation to the Reimus "waxy" type materials produced by hydrolysis of the coffee beans at high

temperature (250-350 degrees F.) during the extraction process.

34. Frederickson 2,410,157 (cited at Nestle Br., p. 9) discloses a process for removing deleterious waxes but he shows no high temperature extract. Reimus '302 describes a process for removing the high temperature "waxy" type materials and preventing the removal of desirable coffee solids that affect flavor. In addition, Frederickson '157 does not disclose the concentrations of the extract or that he proceeds to dehydrate or freeze concentrate the extract.

35. The Sivetz book (vol. 2, p. 15) (cited at Nestle Br., p. 10) discloses, and Struthers freezing-point curve (Item 2) indicates, that a 10% coffee extract freezes at 31.2 degrees F. The freezing point curve, however, is different for each extract. Indeed, even a 10% extract can have a freezing point as low as 30.5

degrees F. The coffee bean blends and the processing techniques definitely influence the freezing point of the extract. Thus, 32 degrees to 45 degrees F. as disclosed in '302 is not near the freezing point.

36. Furthermore, Sivetz states on page 16 of his text that the freeze concentration process has the advantage of coagulating the tarry coffee substances between the ice crystals and that the resulting extract has a markedly reduced hydrolysis flavor and taste. This statement clearly indicates that the "waxy" materials are a result of hydrolysis. Further, Sivetz expects the tarry materials to be removed with the ice. Sivetz did not disclose the plugging of the centrifuge screens or other filter medium and he did not recognize the precipitation of valuable solids which should be avoided.

Moreover, Sivetz does not teach the expedient of settling to remove "tars" prior to freeze concentration.

37. Cottle 3,362,178 (cited at Nestle Br., p. 77) does not disclose a process for coffee. His description refers to other substances but not coffee. The statement on beverages is too broad to conclude that coffee is included since one cannot extrapolate from other beverages to coffee. It is only with coffee extract that the problem of co-precipitation exists ("waxy" materials plus "desirable" coffee solids). Processing conditions disclosed on beer, orange juice, etc., cannot be extrapolated to coffee extract. The Reimus patents offer a specific solution for coffee extract in dealing with the co-precipitation problem.

38. The Svanoe Patent 3,285,021, the corresponding Canadian Patent 699,247 and

the McKay 3,216,833 (cited at Nestle Br., p. 22) are only for freeze concentration. None of these patents anticipates the formation of a precipitate that is a mixture of "waxy" materials and "desirable" coffee solids at the temperature ranges involved.

39. Ganiaris 3,283,522 (cited at Nestle Br., p. 78) discloses the freeze concentration step without any anticipation of the "dewaxing" problem or any indication of the co-precipitation problem.

40. Seltzer 2,891,865 (cited at Nestle Br., pp. 74-75) discloses a process for decreaming tea extract. Neither the composition of the substances involved nor the concentrations are related to Reimus.

41. Smith 3,102,036 (cited at Nestle Br. at p. 8) discloses a process for stripping oxygen from an aqueous solution

prior to freeze concentration. This process is primarily for fruit juices, and if this process were used for coffee, the end result would be foam. Coffee extract forms a very stable foam and no gas should be purged into coffee extract. Smith '036, therefore, cannot be cited as a proper reference.

Reimus' Patents Are Not Invalid
By Reason Of Prior Use And Sale
(Answering Nestle Br., pp. 31, 62-4)

42. The sales contract dated August 12, 1964 did not incorporate any equipment relating to dewaxing.

43. In March 1965, General Foods agreed to permit the installation of such equipment in the Struthers' freeze concentration plant and share the cost with Struthers. Prior to January 1965, General Foods did not even appreciate that a dewaxing operation was necessary.

44. To the best of my knowledge, dewaxing disclosures were not offered for sale to General Foods before January or February, 1965.

s/ Neophytos Ganiaris

NEOPHYTOS GANIARIS

Sworn to before me this
11th day of May, 1981

s/ Adam B. Gilbert

Notary Public

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION,	
Plaintiff,	Civil Action No. 663-72.
v.	
THE NESTLE COMPANY, INC.,	AFFIDAVIT IN OPPOSITION TO NESTLE'S MOTION
Defendant,	FOR PARTIAL SUMMARY JUDGMENT
v.	(GROUP IV)
STRUTHERS WELLS CORPORATION, and STRUTHERS SCIENTIFIC AND INTERNATIONAL COPORATION,	
Additional Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. I reaffirm and include herein by reference all statements made in my Group

I, II and III affidavits. I make this affidavit in opposition to Nestle's motion for partial summary judgment of invalidity of Howell patent 3,367,126 (the Howell '126 patent) and Ganiaris patent 3,636,722 (the Ganiaris '722 patent) referred to in Nestle's Group IV motion.

Introduction to the Howell Invention

2. At the time the Howell '126 invention was developed, the problems with the existing designs of tubular crystallizers* were as follows:

a. The agitator blades scraped the heat transfer surface, thereby

---

* A tubular crystallizer is a unit where the fluid to be processed (e.g., coffee extract) flows in circular tubes.

inducing excessive nucleation and small ice crystals.

b. The agitators for very long tubular crystallizers were equipped with supports; such supports were undesirable for ice crystallization and for processing food products where avoidance of flavor deterioration is extremely critical.

3. The Howell '126 "floating" agitator was a solution to the above problems. It teaches the construction of a tubular crystallizer where the clearance between the agitator blades and the heat transfer surface can be very small, thereby achieving a high heat transfer without any scraping.

Prior Art

4. The prior art did not offer a solution to these specific problems related to ice crystallization. Ferranti

409,205 ('295), Hayes 267,425 ('425), Low 803,770 ('770) and von Post 1,256,747 ('747) (cited in Nestle Group IV memorandum [hereinafter Nestle Br.] at pp. 28-29) disclose different types of floating devices. None of these devices, however, can be applied or are even related to ice crystallizers. Thus, these devices offer no solution to the problems that one had in developing an ice crystallizer for processing coffee and other comestibles.

6. Vogt 1,783,864 ('864), Vogt 1,847,149 ('149), Miller 2,023,607 ('607) and Crighton 2,267,081 ('081) (cited in Nestle Br., p. 29) disclose hollow shafts and tubular heat exchangers. The agitator, however, does not float and the blades scrape the heat transfer surfaces. None of these devices addressed the critical problems solved by Howell.

Indefiniteness (Answering Nestle Br., pp. 22-26)

7. Nestle suggests that the Howell patent is indefinite because

a. the claims are silent as to the shaft length;

b. the claims do not define the means for exhausting spent refrigerant;

c. "substantially" is indefinite; and

d. "gas under pressure" is indefinite.

Nestle is incorrect.

8. Obviously, the length of the shaft is not important. One skilled in the art knows that he can construct a short tubular unit and easily adjust the agitator blades to avoid scraping. The length where bending will start to cause scraping problems can easily be calculated depending on the materials of

construction. Therefore, specifying a numerical value will be meaningless.

9. One skilled in the art knows that the refrigerant has to be exhausted and circulated.

10. The claim for "substantially" the same weight is not indefinite. It is obvious that the invention refers to a floating shaft. If the shaft floats, the weight of the shaft must be slightly lower or exactly the same as the weight of the displaced liquid.

11. The term "gas under pressure" is not indefinite. The numerical value is not important because it will be different for each liquid and the material of construction used for the agitator.

Prior Offer for Sale
(Answering Nestle Br., pp. 20, 51-2)

12. The Howell '126 concept of a floating shaft was incorporated in the equipment sold to General Foods Corporation under the 1965 contract. The shafts for the first stage crystallizer under the 1964 contract did not incorporate (and could not have incorporated) the Howell '126 concept. Mr. Howell was not associated with Struthers in 1964. He joined the company sometime in March or April 1965.

Introduction to the Ganiaris Invention

13. A freeze concentration system involving ice crystallization and ice crystal separation consists of a feed pump, a crystallizer, a centrifuge (separation device) and pipe lines. There may also be a feed tank prior to the feed pump and a product tank at the

end of the pipe lines. Only the crystallizer requires a holding volume and, in turn, a residence time for the coffee extract or any other fluid being processed.

14. In a freeze concentration system involving ice crystallization and ice crystal separation, variations in the process used to process coffee will have an effect on the design (including the size and configuration) of the two main pieces of equipment -- the crystallizer and centrifuge. The size of the holding tanks or pipe lines is not influenced by the process variables relating to ice crystallization or ice separation.

15. Ganiaris '722 discloses the residence time of 2.5 hours for the entire system (crystallizers, tanks, pipe lines, and the rest). To a person skilled in the art, it is obvious that the residence time has meaning only in

conjunction with the crystallizer volume and ice separation device (centrifuge).

16. The size and other features of the design of the "feed tank" or the "product tank" can be determined without any regard to the crystallization or centrifugation steps. The tanks can be very small regardless of the size of the freeze concentration system. The same holds true for the pipe lines; they can be very short or very long depending on what is necessary. As a matter of fact, the "feed tank" and the "product tank" can be completely eliminated. The product tank of the extraction process can be the "feed tank" to freeze concentration, or the feed tank to freeze-drying can be used as the "product tank" of the freeze concentration system.

17. On the other hand, the "holding volume" of the crystallizer is critical for two reasons:

a. It should be sufficiently large for ice crystallization; and

b. It should be sufficiently small to avoid precipitation of coffee solids.

18. Struthers' experimental studies established that a 2.5 hours residence time is sufficient to avoid coffee solids precipitation and to accomplish ice crystallization. Although in Ganiaris '722, the 2.5 hours refers to the entire system, it is obvious from the above that the "holding volume" of the crystallizer is the only "important" volume affecting residence time.

19. In designing a mechanical device (crystallizer) with the required "holding volume" for a 2.5 hours residence time, it was recognized that the device must provide the required "heat transfer area" for removing the heat released in the

crystallization zone by the formation and growth of the ice crystals.

20. After investigating different types of crystallizer designs, we concluded that the "tubular" crystallizer offered the best possibilities for a commercially successful freeze concentration plant. However, all "tubular" designs had one limitation: the ratio of volume to heat transfer area was fixed by the diameter of the tube.

21. Based upon geometric calculation, the tubular crystallizer had to be designed with tubes having diameters in the range of 4.8 inches to 6.72 inches in order to meet the process conditions.

22. Since the use of such tubes was uneconomical for using large scale equipment, the concept of providing an annular crystallizer volume was developed. By reducing the volume of the

tube with a hollow shaft (or inner tube), one could use tubes with larger diameters and still maintain the ratio of volume to heat transfer area within the desired range (1/7 to 1/10 ft.) to avoid precipitation of coffee solids.

Prosecution of the Ganiaris '722 Patent
(Answering Nestle Br., pp. 32-36)

23. The disclosures in the British Provisional application, the Ganiaris "A" and Ganiaris "B" applications are the same. All these applications disclose

a) the precipitation problems;

b) the 2.5 hours residence time;

c) the volume to area ratio of 1/7 to 1/10 ft.;

d) the "annular" configuration;

e) the 20% to 45% coffee solids for the extract; and

f) the advantages of the crystallizer structure described in the specification.

Therefore, regardless of how these applications were prosecuted, the specifications are the same in all three of these applications. Only the claims differ.

24. In the prosecution of the Ganiaris "A" and "B" applications, all the proposed claims were broad with respect to the volume of the crystallizer. However, the '722 claims are specifically limited to "annular" volume. As is explained below, the difference between "annular" versus "tubular" crystallizers is of great importance.

25. Also the concept of "serially connected crystallizer means" is significant. A parallel arrangement of

the tubes is not feasible for coffee extract.

26. The specification is also clear with respect to coffee precipitation and ice crystallization. For maximum crystal growth without precipitate formation, the residence time and the ratio of volume to area must be established. The specification of Ganiaris "A", "B" and the British Provisional all clearly state the residence time of 2.5 hours and the ratio of 1/7 - 1/10 ft.

27. As to the Ganiaris "A" application, Nestle suggests that the specification is not clear with respect to the numerical value of the ratio of volume to area (Nestle Br., p. 32). The fact is that a mistake was made in typing the Ganiaris "A" application which was overlooked for a period of time during the prosecution. But this is not a reason for invalidity of the Ganiaris

'722 patent. The Ganiaris '722 patent states clearly the correct numerical values of the ratio and the required dimensions as they were originally disclosed in the British Provisional application.

28. Furthermore, it is obvious from the specification that the object of the invention is to have maximum heat transfer area for a given volume. One skilled in the art would have easily recognized that the error of the ratio in the Ganiaris "A" was typographical. Thus, even the examiner understood that the object of the invention was to have maximum heat transfer area, for in his brief to the Board of Appeals, he stated that the applicant was concerned with providing a "large area of cooling surface relative to the volume of material being treated." (Ex. 13, pg. 0043)

29. Nestle also argues that the Ganiaris "A" fails to disclose "means to provide a flow rate" (Nestle Br., p. 35). Ganiaris "A" does not specifically show in the specification any means for providing a flow rate. A person skilled in the art, however, would have no difficulty understanding that the coffee extract must be fed by some kind of means into the crystallizer. The extract cannot go in and out of a tubular crystallizer and have a residence time of 2.5 hours unless there is a pump or some other device to do so.

The Claims in Ganiaris' "A" and B" applications are different (Answering Nestle Br., pp. 37-38)

30. The Ganiaris "B" application resulted in a patent (Ganiaris '722) and the claims are significant and distinct from the Ganiaris "A" application. The principal distinction is that in the

Ganiaris "A", the volume to area ratio (1/7 - 1/10 ft.) was not limited to the annular volume, nor moreover, was the crystallizer limited to plural serially connected tubes.

Prior Art

31. Vogt 1,847,149 ('149) (cited in Nestle Br., at pp. 14-15, 18) discloses a ratio 1:16 to 1:3 and dimensions are in inches, whereas Ganiaris '722 discloses the 1/7 to 1/10 ratio and the dimensions are in feet. Struthers did not urge this difference during the prosecution of Ganiaris "B" but it did and does exist. This dimensional difference takes Vogt out of the '722 range.

32. Harrington 2,306,602 ('602) (cited in Nestle Br., at p. 15) discloses the "annular" type heat exchanger with a disclosure of how to connect a plurality of tubes. Ganiaris '722 claims plural

serially connected crystallizer means which Harrington does not disclose. In addition, Harrington does not disclose the 40% flow rate.

33. Reimus 3,381,302 ('302), Kolner 2,886,587 ('587) and Jackson 3,212,283 ('283) (cited in Nestle Br., p. 15) do not disclose either serially connected "annular" crystallizer tubes or the flow rate limitation of 40%.

34. Cottle 3,362,178 ('178) (cited in Nestle Br., p. 18) is not related to Ganiaris '722. The Ganaris '722 apparatus is limited to coffee; orange juice or other products do not present the same problems as previously stated. Also Cottle is for a process, not an apparatus.

35. Svanoe 699,247 ('247) and 3,285,021 ('021) (cited in Nestle Br., at p. 48) discloses a "tubular" crystallizer where the heat transfer area to volume

ratio is fixed by the tube diameter. Ganiaris '722 discloses an "annular" type crystallizer where the ratio is not limited by the tube diameter. Any size of tube over 6.72 in. can be used and still maintain the narrow range of 1/7 to 1/10 ft. ratio. Svanoe '247 does not disclose any volume to area ratio for coffee extract. On page 8, Svanoe discloses a 50 - 500 gallon volume (preferably 200 gallons). The heat transfer area is not stated anywhere in relation to these volumes.*

36. Ganiaris '722 discloses "means to provide a flow rate of said coffee solution through the annular

---

* On page 13, Svanoe discloses a heat transfer area of 100-500 square feet for orange juice (not for coffee). Furthermore, nowhere does Svanoe disclose a preferred heat transfer area of 250 square feet.

crystallization zone . . . of greater than 40%. . . . ." This clearly indicates that a pump or any other device should be provided to feed the coffee extract at the over 40% flow rate. Svanoe '247 discloses the velocity of the fluid within the freezing zone. The velocity within the tube is not the same as the flow rate of the coffee extract feed.

37. Svanoe ('247) discloses a crystallizer having all the tubes in parallel connection, whereas Ganiaris '722 clearly states "serially connected." This difference is fundamental. In a parallel arrangement, tubes will freeze up. There is no practical way to distribute uniformly the flow of the coffee extract in each tube and maintain the same velocity of flow in each tube. It should be recognized that a slurry of coffee extract and ice crystals is a non-Newtonian fluid and its viscosity depends on the slurry velocity within the tube. Thus, once the flow velocity diminishes in one tube, the viscosity keeps increasing and, in turn, the flow

diminishes further until there is no motion within that tube and a freeze up is complete.

38. The Ganiaris '722 "serially connected" annular tubes avoid this foregoing problem because it allows the designer to use large tubes and, in turn, short overall lengths; thus, there is no need for a parallel arrangement.

39. Svanoe 3,347,058 ('058) (cited in Nestle Br., pp. 49-50) discloses 80 - 300 sq. ft. in the crystallizer and a preferred volume of 200 gallons in the freezing zone. According to his disclosure, the freezing zone includes the external heat exchanger and the crystallizer. Therefore, Nestle's calculation of a ratio of 3:1 to 11:1 is without any basis. The heat transfer area of the heat exchanger is not included in the 80-300 sq. ft.

40. Svanoe '058 disclosure of a plurality of crystallizers in series refers to "tubular" crystallizers with an external heat exchanger. As was explained, such a unit has several limitations and cannot be compared to Ganiaris '722.

41. Krause 2,241,726 ('726) (cited in Nestle Br., at p. 47) discloses a process for separating ice from concentrated liquor by pressing the extract-ice slurry. However, he does not disclose that such a process can be used after the Ganiaris '722 type of crystallizer for coffee extract or that

at least two serially connected crystallizers should be used. The Ganiaris '722 claims are limited and specific.

42. Ganiaris '722 claims a hollow shaft in part (c) and should be viewed as a part of an overall apparatus. Howell '126 (cited in Nestle Br., p. 46) or any other prior art on hollow shafts is immaterial. Ganiaris '722 claims a specific combination of certain components for a specific use; he does not claim just a hollow shaft. The combination of components is not found in Howell or the other references.

Indefiniteness
(Answering Nestle Br., pp. 32-36)

43. Nestle suggests that the '722 patent is invalid because

a) the claims do not point out

the ratio of volume to area (Nestle Br., pp. 32); and

b) the flow rate constitutes no more of a distinction than residence time (Id. at 33).

Nestle is incorrect.

44. In the specification of the '722 patent, it is clearly stated that the numerical value should be 1/7 to 1/10 ft. to avoid precipitation. The claim states that the annular volume to the area should be such that precipitation is avoided. It is obvious to one skilled in the art that the ratio set forth in the specification should be practiced to benefit from the invention.

45. The object of the invention is not only to develop an apparatus that avoids precipitation of coffee extract. Ganiaris '722 discloses an apparatus to be used for freeze concentrating coffee extract (crystallizing water and

separating the ice crystals) and to avoid precipitation. In that context, means to provide a flow rate in a total structure does not render the total structure unpatentable.

46. With respect to the volume of the crystallizer versus the volume of the system, it is known to one skilled in the art that, for the freeze concentration system, the volume of the crystallizer is the volume of the system. The tanks, pipes etc. are not required and do not impose any limitations. The crystallizer volume and the volume of ice separation device (negligible volume) are the limiting factors with respect to the residence time for avoiding precipitation.

Prior Offer for Sale
(Answering Nestle Br., pp. 20-21, 51)

47. The sales contract dated August 12, 1964 included a complete freeze

concentration system with two crystallizers. Only one of the crystallizers had a hollow shaft. In 1964, the one crystallizer with a hollow shaft was used as a first stage crystallizer and the coffee extract was concentrated from about 24% to 36-37% coffee solids. Furthermore, the crystallizer had several tubes connected in parallel.

48. The Ganiaris '722 concept was developed later and involved concentrating coffee extract from 20-45% and the tubes were "serially connected" in serpentine form, as distinguished from the earlier system where the tubes were parallel and only connected at the beginning and the end.

49. The equipment supplied to General Foods under the September 30, 1965 sales contract did not come within the claims of the '722 patent because,

for example, the equipment did not incorporate the flow rate of "greater than 40% per hour of the volume of each crystallizer" specified in claim 1(d) of my '722 patent.

s/ Neophytos Ganiaris

NEOPHYTOS GANIARIS

Sworn to before me this
11th day of May, 1981

s/ Adam B. Gilbert

Notary Public

UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION, Plaintiff,	Civil Action No. 663-72.
v.	SUPPLEMENTAL AFFIDAVIT IN OPPOSITION TO NESTLE'S MOTION FOR PARTIAL SUMMARY JUDGMENT (GROUP I)
THE NESTLE COMPANY, INC., Defendant,	
v.	
STRUTHERS WELLS CORPORATION, and STRUTHERS SCIENTIFIC AND INTERNATIONAL CORPORATION, Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. It has come to my attention that the following statements which I intended to include in my original affidavit in

opposition to Nestle's Group I motion for summary judgment were inadvertently omitted. These statements demonstrate that the subject matter of the Muller '522 patent claims is adequately disclosed in the specifications of Muller '007 (I) and Muller II:

2. The concentrating means are fully disclosed in Example I of Muller '007 (p.0011, Muller II).

3. The agitating means co-acting with concentrating means are disclosed on p. 3, lines 33-36, Muller '007 (p. 0009, Muller II).

4. The centrifuge means are disclosed in Example I of Muller '007 (p.0011, Muller II).

5. Freezing means are disclosed in Example I of Muller '007 (p.0011, Muller II).

6. Means for removing moisture under vacuum from frozen extract by

sublimation are disclosed on p. 4, lines 22-23 and Example I, line 65 of Muller '007 (p. 0012, Example I, Muller II).

7. Heat source means co-acting with vacuum means for heating and drying the frozen extract are disclosed in Example I, lines 67-73 of Muller '007 (Example I, Muller II).

8. Means co-acting with the centrifuge for washing ice separated from the extract are disclosed on p. 3, lines 43-44 of Muller '007 (p.0008, line 13, Muller II).

9. Means co-acting with the centrifuge means for recovering solids from washings are disclosed on p. 3,

lines 19-20 of Muller '007 (p.0008, line 15-17, Muller II).

s/ Neophytos Ganiaris

NEOPHYTOS GANIARIS

Sworn to before me this
1st day of June, 1981

s/ Adam B. Gilbert

Notary Public

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION,	
Plaintiff,	Civil Action No. 663-72.
v.	SUPPLEMENTAL AFFIDAVIT IN OPPOSITION TO NESTLE'S MOTION FOR PARTIAL SUMMARY JUDGMENT (GROUP II)
THE NESTLE COMPANY, INC.,	
Defendant,	
v.	
STRUTHERS WELLS CORPORATION, et al.,	
Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. I submit this brief supplemental affidavit to clarify certain matters addressed in my original "Group II affidavit" (sworn to May 11, 1981)

which Nestle has attempted to criticize in its reply memorandum.

THE FRENCH PATENT:

2. In Nestle's reply memorandum (pp. 11-12) Nestle asserts that the distinction made in my prior Group II affidavit (regarding the '295 and French patents) between "internal recycling" and "external recycling" is a "distinction without a difference". The difference, which I thought I made clear in paragraph 20 of my prior affidavit is critical to an understanding of the patents in this case. An example will make this clear. If the stream entering the plant contains approximately 20% coffee and approximately 80% water and the object of the process is to obtain a product stream consisting of 50% coffee and 50% water, if there were 100 pounds of stream entering the plant the

following would occur: The product stream leaving the plant would consist of approximately 20 pounds of coffee and approximately 20 pounds of water representing 40% of the original 100% that entered the plant. The remaining stream would consist of approximately 60 pounds of ice, containing less than 5% coffee solids. If this remaining stream were reintroduced into the system (internal recycling), as Nestle suggests, then the end result would be a composition of coffee the same as the stream that entered the plant, namely 20% coffee solids and 80% water and nothing would be accomplished within the plant. By contrast, by further processing the stream outside the above system (external recycling), the desired concentration of 50% coffee solids and 50% water is obtained and the 60% solution of ice with less than 5% concentration of coffee

solids can be utilized in another section of the coffee processing plant, all of which is set forth in greater detail in my '295 patent.

NESTLE'S SECTION 102(f) CLAIM:

3. Nestle attacks ¶5 of my original affidavit by claiming that I did not make clear that the disclosure of my invention in '295 to General Foods took place before the April, 1965 meeting with Maxwell House personnel. Obviously, my affidavit was intended to make that point; however, I wish to eliminate any uncertainty by emphasizing in this supplemental affidavit that the meetings with General Foods discussed in my earlier affidavit at which I disclosed the '295 invention took place in 1965 but prior to the April 21, 1965 meeting.

NESTLE'S SECTION 102(b) CLAIM:

4. Finally, I want to respond to Nestle's statement in its reply memorandum (at p.27) that I don't deny that the subject matter of '295 and '039 was "on sale". The statements in my original affidavit (at ¶¶ 3-4) were intended to convey that, but I will make it clear here again to eliminate any uncertainty: to my knowledge, the features discussed in ¶¶ 3-4 of my earlier affidavit that were not sold to General Foods were not offered for sale to anyone more than one year before the

effective filing dates of the two inventions.

s/ Neophytos Ganiaris

NEOPHYTOS GANIARIS

Sworn to before me this
8th day of June, 1981

s/ Remy S. Ferrano

Notary Public

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW JERSEY

STRUTHERS PATENT CORPORATION,	
Plaintiff,	Civil Action No. 663-72.
v.	SUPPLEMENTAL AFFIDAVIT IN
THE NESTLE COMPANY, INC.,	OPPOSITION TO NESTLE'S MOTION
Defendant,	FOR PARTIAL SUMMARY JUDGMENT
v.	(GROUP IV)
STRUTHERS WELLS CORPORATION, and STRUTHERS SCIENTIFIC AND INTERNATIONAL COPORATION,	
Additional Defendants on Counter-claim.	

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

NEOPHYTOS GANIARIS, being duly sworn, deposes and says:

1. This affidavit is submitted to supplement my affidavit in opposition to

Nestle's motion for partial summary judgment (Group IV). In particular, I address Nestle's allegations regarding prior offer for sale of the Howell '126 patent and the Ganiaris '722 patent as set forth in Nestle's reply memorandum.

2. As I stated in my affidavit on Nestle's Group I motion for summary judgment, I was responsible for the design and installation of a plant sold to General Foods Corporation ("General Foods") by Struthers in 1964. This is the Hoboken plant to which Nestle makes reference in its reply memorandum.

3. Nestle argues that the Howell invention was sold to General Foods in 1964 (Nestle Reply Mem., p. 18). Nestle's contentions are in error. As I noted in my original Group IV affidavit, a crystallizer with a hollow shaft was sold to General Foods pursuant to the 1964 contract. That shaft did not, and

was not intended to, "float." Struthers' answer to General Foods' interrogatory 119 is not completely clear on this matter, and if it is inconsistent with the foregoing, the answer is wrong.

4. With respect to the '722 patent, Nestle attempts to impeach the statement in my Group IV affidavit that the concept for the '722 patent "was developed" after the August 1964 sales contract with General Foods, citing Struthers' answer to interrogatory 62 which places the date of conception in April 1964 (Nestle Reply Mem., pp. 46-47). However, conception is not the same thing as development of an invention. Indeed, the same interrogatory cited by Nestle states that the first reduction to practice of the invention was in "early 1965." Accordingly, my statement that the invention "was developed" after the first contract of sale to General Foods is

entirely consistent with the

interrogatory answer which Nestle cites.

s/ Neophytos Ganiaris

NEOPHYTOS GANIARIS

Sworn to before me this
29th day of June, 1981

s/ Adam B. Gilbert

Notary Public

STRUTHERS SCIENTIFIC AND INTERNATIONAL CORPORATION

NEW YORK CITY BRANCH OFFICE

SUBJECT: Maxwell House FreCon Unit

DATE February 15, 1965

ADDRESSEE: J. G. Muller

SENDER: s/ N. Ganiaris
N. Ganiaris

ANSWERING YOUR COMMUNICATION

Original Schedule

On December 28, 1964, the writer, J. J. Pike and J. G. Muller met with Maxwell House - Engineering Division personnel and agreed on the following schedule:

1. Testing of the refrigeration unit on 1/9/65.
2. Start-up of the system with sugar solution on 1/11/65 - 16 hours per day.
3. Start-up of the system with coffee extract on 1/17/65 - 16 hours per day.
4. Initiate the first 120 hours run with coffee extract on 2/1/65 - 24 hours per day.

Furthermore, it was understood that SSI will have all the responsibilities with respect to the start-up operation; however, Maxwell House will provide all the necessary man-power required until the plant is in full operation.

Start-Up Progress

1. Week of 1/10 - 8 hours Day

a) All mechanical work on crystallizers has been completed on 1/14.

b) Process piping and other minor installations of auxiliary piping were completed on 1/16.

c) Refrigeration unit was tested on 1/13-15.

d) Sugar solution was fed to the system in order to make some ice and test the refrigeration unit.

The delay of one week from the original schedule was due to difficulties with the alignment of the crystallizer agitators and also due to incomplete installation.

2. Week of 1/17 - 16 hours Day

a) The following work on centrifuges was completed on 1/17:

1. Change of speed to (approximately) 2300 RPM
2. Change of gaskets to avoid leakage.
3. Alterations on the scroll to avoid rubbing on the basket.

b) Start-up with sugar solution in the first stage on 1/18.

c) Start-up with sugar solution of the entire system on 1/21.

The performance of the system was satisfactory to SSI and MH engineers. However, it was decided to continue on sugar solution until the following process results are accomplished:

1. Concentration of sugar solution to 45% or higher.
2. Ice production rate of (approximately) 500 lbs/hr with losses of less than 2.5%.
3. Continuous operation of the system on automatic control.

3. Week of 1/24 - 16 hours Day

a) The system has been operated continuously for a maximum period of 6 to 8 hours.
b) The design specifications have been met with respect to the ice production, losses and final concentration. The system produced up to 51% sugar solutions during several runs. The maximum ice rate was (approximately) 650 lbs/hr. net plus 300 lbs/hr of wash water. The losses were maintained to less than 2.5% of dissolved solids during only one six-hour run.

c) Several attempts to operate the crystallizers with the automatic temperature controls have not been successful.

The performance of the system was satisfactory to Maxwell House Management. However, SSI and MH engineers decided to remain on sugar solution for a few additional days in order to test the temperature controls again; the conditions appeared favorable since all other problems have been eliminated.

4. Week of 1/31 - 15 hours Day

a) Change of centrifuge screens which have been badly damaged.
b) Work on the centrifuge to avoid any rubbing between the scroll and the basket or the basket and the housing.
c) Work on the flexible connections of the crystallizers in order to avoid any failures during ice build-up in the unit.
d) Installation of the system feed pump.
f) Testing of the temperature automatic controls with sugar solution.

On February 3, SSI and MH engineers decided on the following:

1. Drain the system.
2. Initiate coffee runs on Feb. 4.
3. Continue testing of the temperature controls with coffee extract.
4. Provide orifice meters for flow rate indication.

The first stage was operated for 2 hours on Feb. 4 with coffee extract. The unit was shut-down due to foam and wax.

On February 5, a 4 hour run was made and the first stage was shut-down due to the failure of one flexible connection on the crystallizer. However, a thick layer of wax was observed on the centrifuge screen. There was not any problem with foam.

At a meeting held on Feb. 5, SSI and MH engineers decided on the following:

1. Replace flexible connections on crystallizers as soon as the necessary materials are available.
2. Initiate the design of a permanent dewaxing system and install the necessary equipment as soon as possible.

3. Initiate a 24 hour Day, starting the week of February 7.
4. Replace system's feed pump since it creates considerable foam.
5. Operate the first stage only; until enough 37% extract has been accumulated to start the operation of the second stage.

5. Week of 2/7/ - 24 hour Day

a) On February 8 and 9, several attempts were made to operate the first stage with coffee extract. However, continuous operation for more than 30 minutes was impossible due to wax.

At a meeting held on 2/10, SSI and MH engineers decided on the following:

1. Remove all extract from the unit and clean the system with hot-cleaning solution.

2. Dewax a large quantity of extract and operate the system on a close-cycle until the permanent dewaxing equipment is installed.

3. Initiate laboratory test on wax by MH-Research Division.

4. SSI will design the dewaxing equipment on the basis of the laboratory data.

5. Install all dewaxing equipment by the first week of March.

6. Initiate the first 120 hour run after the dewaxing equipment has been installed.

b) On February 10, two of the shafts of the first stage crystallizer were damaged during the cleaning operation.

At a meeting held on February 11, SSI and MH engineers decided to shut-down and perform the following jobs:

1. Repair shafts of the crystallizers.
2. Install the automatic reset on the refrigeration unit.
3. Re-pipe the crystallizer drains.
4. Replace the flexible connections of the crystallizers.
5. Replace the system feed pump.
6. Install the orifice meters.
7. Start dewaxing the extract late Tuesday 2/16 or early in the morning on 2/17.

Future Schedule

1. Operate the system on a close cycle until 3/5/65.

2. Install dewaxing equipment prior to 3/5/65.

3. Initiate the first 120 hour run on 3/8/65 in order to produce 450 lbs. office per hour and maintain the losses to less than 2.5%.

4. Initiate the second 120 hour run on 3/15/65 in order to produce 600 lbs of ice per hour and maintain the losses to less than 1%.

5. Estimated date of completion is April 2, 1965.

Conclusions and Recommendations

It appears that there is an estimated delay of four weeks due to the following reasons:

1. Late Start-up on Sugar: The start-up date on sugar solution was delayed by one week due to difficulties with the alignment of the agitators and incomplete installations.

2. Man-Power Requirements: Both organizations have failed to provide the man-power that was requested by the writer on January 4, 1965.

SSI had one engineer available from Jan. 11-16, and Jan. 21-27, instead of two engineers in accordance with the original schedule. In addition, only two engineers were available from 2/1 - 2/10.

MH informed the writer on Jan. 14, that from Jan. 17 to Feb. 1 they would provide one engineer per shift and no technicians. With reference to their

over-all program, the FreCon Unit had priority No. 6.

3. Wax in the Extract: This problem did not receive the proper attention from either organization, MH or SSI. Unless the two companies clarify their position with respect to the following points, further delays will occur:

1. Responsibility of technical solution for the wax problem.
2. Responsibility of design and installation for the dewaxing equipment.
3. Relation between the time invested in solving the wax problem and the six months start-up period of the sales contract.
4. Which company will pay the cost of the dewaxing equipment (approximately $5,000).
5. Definition of the start-up time.

At a meeting held on February 10, 1965 (N.G., C.J.S., P. Clyne, and M. Gottesman), the writer expressed the opinion that the time invested for solving the wax problem should not be included in the six month start-up period. During the meeting, it was decided that MH wll continue with the laboratory sale investigations on waxes and SSI will design the equipment on the basis of the MH-Res.Div. data. However, at our level, we would not discuss the responsibilities of the two organizations and we all agreed to review the issue with our Managements.

In the event that SSI Management does not like to enter into any

discussion with MH due to business reasons, please advise the writer with respect to his responsibilities on the wax problem.

NG:gmc